

QUARTERLY REVIEW of PEDIATRICS

Vol. 4 No. 4



November 1949

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1. Adair, F. L., Dieckmann, W. J., and Grant, K.: *Am. J. Obst. & Gynec.* 32:560 (1936).
2. Talso, P. J., and Dieckmann, W. J.: *Am. J. Obst. & Gynec.* 55:518 (1948).
3. Dieckmann, W. J., and Priddle, H. D.: *Am. J. Obst. & Gynec.* 57:541 (1949).

4. Neary, E. R.: *Am. J. Med. Sci.* 212:76 (1946).
5. Healy, J. C.: *J. Lancet* 66:218 (1946).
6. Chesley, R. F., and Annitto, J. E.: *Bull. Marg. Hague Maternity Hosp.* 1:68 (1948).
7. Kelly, H. T.: *Penn. M. J.* 51:999 (1948).

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Published quarterly in February, May, August and November. The annual cumulative subject and author index is bound in the November issue.

Subscription rate: \$11.00 per year; \$28.00 for 3 years.

WASHINGTON INSTITUTE OF MEDICINE

Editorial and Administrative
Departments:

1708 Massachusetts Ave., N. W.

Washington 6, D. C.



Advertising Department:

2000 Connecticut Ave., N. W.

Suite 710

Washington 8, D. C.

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Entered as second-class matter at the Post Offices at Washington, D. C.,
and Baltimore, Md., under the Act of March 3, 1879.

FOREWORD

The prime function of the *QUARTERLY REVIEW OF PEDIATRICS* is to make a survey, with a critical eye, of the important new contributions in every branch of pediatrics. Original reports are abstracted by pediatricians familiar with the subjects under consideration. The Editors and Editorial Board check over all abstracts and add interpretive or critical comments whenever necessary. The "Bookshelf" department reports informatively on new books the pediatrician should know about. Thus, within the covers of a single journal, there is brought together a concise chronicle of pediatric progress, well organized, reliable and complete. By exploring the entire expanse of medical literature the *QUARTERLY REVIEW OF PEDIATRICS* keeps its readers abreast of the most recent progress in all of pediatrics. A subscription to *THE QUARTERLY REVIEW OF PEDIATRICS* represents a continuous seminar on advances in pediatrics.

For convenience of reference the abstracts are grouped as follows:

- | | |
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| | Announcements |

Issues of the *QUARTERLY REVIEW OF PEDIATRICS* appear in February, May, August, and November. A cumulative index for each volume is included in the November number. Suggestions, correspondence and editorial communications should be addressed to Irving J. Wolman, M.D., *Editor*, The Children's Hospital, 1740 Bainbridge Street, Philadelphia 46, Pa. Subscriptions should be mailed to the Washington Institute of Medicine, 1708 Mass. Ave., N. W., Washington 6, D. C. Annual Subscription: \$11.00. Three years: \$28.00.



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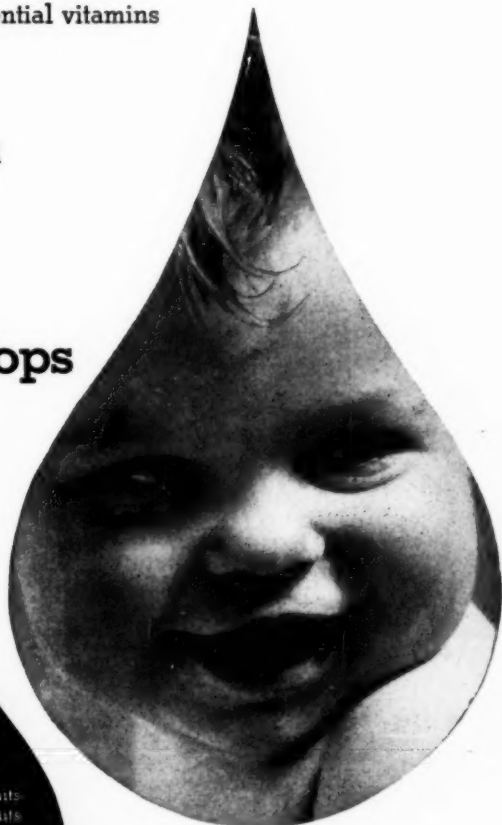
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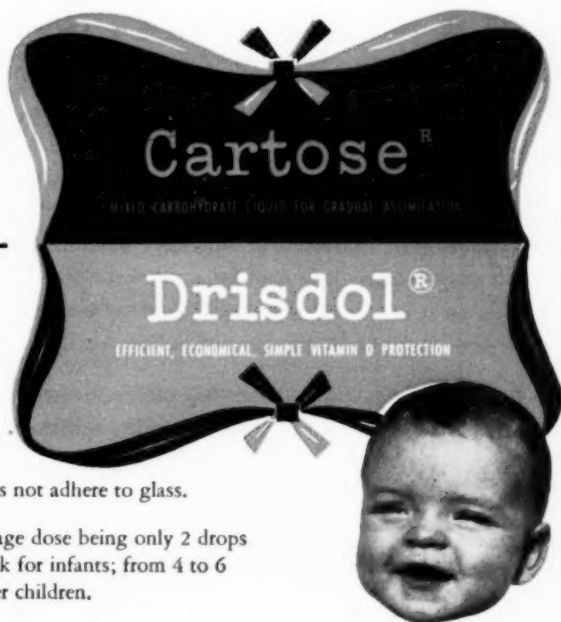
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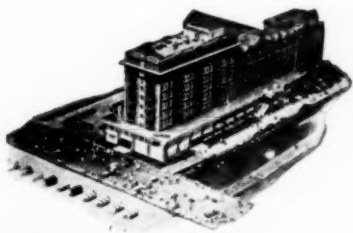
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Volume 4



Number 4

November 1949

SPECIAL SECTION ON CHILDREN'S TEETH, DENTAL CARIES AND
RELATED PROBLEMS

*Foreword**

A recent pronouncement of the Council on Dental Health of the American Dental Association has given an authoritative green light to the dentists, encouraging them to proceed with topical fluoride treatment for prophylaxis against dental caries. Thousands of parents question their physicians with respect to the soundness of this procedure. All of us should know something about the latest views with respect to the cause and cure of dental decay.

Scrutiny of the current literature shows that there are several spheres of dental research with respect to caries, and considerable overlapping. One school of investigators is developing the thesis that cavities are initiated and continue to progress through the agency of eroding acids in the mouth which arise from food carbohydrates fermented locally by specific microorganisms. Another school is concentrating upon the subtle effect which fluorides can exert upon the hardness of the tooth surface. A third group is stressing the merits of the balanced diet, with much disputation as to the extent to which a high intake of carbohydrates, and sugar in particular, ties in with fermentation in the mouth.

The vigor which attends the support of these theories and others less fashionable makes it clear that much remains to be learned about many features of tooth decay. Obviously many interrelated influences are at work. In order to bring our readers up to date in this confusing field we have prepared a series of representative abstracts dealing with the teeth, gums, caries and related topics. Some editorial comments have been interspersed which may aid in evaluating the points made. Most authors overtly or tacitly accept the "orthodox" interpretation of pathogenesis, which ascribes the leading role to local erosion of enamel by fermentable carbohydrates in the diet. With an open mind on this question, we have included papers which question this belief.—L. J. W.

* We are grateful to Julian Boyd, M.D. and Ned B. Williams, D.D.S. for many criticisms and helpful suggestions.

A. The Pathology of Dental Caries

The Nature of Dental Caries and Its Control. *The Michigan Workshop on the Evaluation of Dental Caries Control Technics*. J. Am. Dent A. Jan. 1948.

In September, 1947 a large number of dentists, physicians, biochemists, nutritionists and dental health educators enrolled at the University of Michigan for a series of seminar or "workshop conferences" on dental caries and its control. Dental caries was defined by this group as "a disease of the calcified tissues of the teeth. It is caused by acids resulting from the action of micro-organisms on carbohydrates, and is characterized by a decalcification of the inorganic portion, accompanied or followed by a disintegration of the organic substance of the tooth." The acids responsible for the caries were thought to be derived from carbohydrate substances which have been acted upon by enzymes coming from the microbial flora of the mouth: Lactobacilli, aciduric streptococci, diphtheroids, yeasts, staphylococci and certain strains of sarcina. The Lactobacilli were stated to be the only micro-organisms which show a significant increase with the initiation of caries. It was agreed that an acid potential of about pH 5.0 is sufficient to decalcify the inorganic structure of a tooth. The time that the acid must be in contact with the tooth in order to produce decalcification is not known. The acid action is made possible by circumstances or structures which retain the acid in contact with the tooth substance. The factors include: (1) the dental plaque, an organic nitrogenous mass containing multitudes of micro-organisms firmly adhering to the teeth; (2) the anatomic characteristics of the tooth; (3) the position or arrangement of the teeth in the dental arch and (4) the presence of dental appliances. Natural factors in the mouth, such as the amount and buffering capacity of saliva, contribute to the dissipation of acids formed on the tooth surface.

The first visible evidence of caries on an intact surface of enamel was described as a change in the optical properties. By reflected light this change appears as a whitening, and by transmitted light as a darkening, of the region. The substance of the enamel at the surface disintegrates, and micro-organisms and debris resulting from the loss of substance accumulate in the interspaces. When the process reaches the dentino-enamel junction it progresses through the dentinal tubules toward the dental pulp. At this stage the overlying enamel may be undermined. Defects in the enamel such as lamellae, certain pits and fissures, and artificially produced defects can afford pathways for the entrance of micro-organisms and may result in caries proceeding from the surface of the defect. Caries also may begin on the thin layer of cementum and proceed into the dentin.

Dental prophylaxis consists of mechanical cleaning, smoothing and polishing of the tooth surfaces. Prophylaxis will remove bacterial plaques from the accessible surfaces of the teeth but not from inaccessible surfaces such as pits, fissures and interproximal surfaces. There is no statistical

evidence that prophylaxis three or even more times a year will reduce the dental caries attack rate. It is impossible to state how frequently prophylaxis must be provided to prevent cavity formation. Evidence has been presented that plaques may re-form on tooth surfaces in one to four days. "There is little scientific evidence that a reduction in the caries attack rate may be expected from a toothbrushing program. However, the possibility that adequate toothbrushing may reduce the incidence of dental caries should not be ignored".

The committee could find no satisfactory evidence that commercial chewing gum reduced or stimulated the number of acidogenic bacteria in saliva. (The sugar content of commercial chewing gum is approximately 60% by weight). "There is no evidence that sodium fluoride in a chewing gum is effective as an anticaries agent". Dentifrices probably contribute to the prevention of plaque formation on those tooth surfaces which are accessible to the bristles of the toothbrush. The proper use of a dentifrice, however, will not prevent entirely the formation of some plaques. A dentifrice which contains an abrasive is more effective in a given length of time. The brushing technic is more important than the dentifrice. "A dibasic ammonium phosphate dentifrice, when used in combination with a like mouthwash, produced a significant reduction in the count of oral *Lactobacilli*. However, it would be desirable to have confirmatory evidence as well as clinical demonstration of reduction of the incidence of caries". The available evidence does not justify the use of fluoride dentifrices.

In summary, maintenance of oral hygiene by dental prophylaxis and toothbrushing with acceptable aids can be recommended for numerous reasons, although the evidence that such measures are effective in the prevention of dental caries is limited and, at present, inadequate. 3 references.

(Definitions which imply full knowledge of dental caries as a disease may hinder rather than promote better understanding. There is need for much basic work relating to the constants and variables in the pattern of evolution of tooth decay; the studies must deal with the individual tooth, the individual subject, and the population at large. As such studies are completed, it is reasonable to assume that factors which now are controversial will be relegated to their true place in the picture as a whole. An open-minded approach toward the whole field of study is needed to speed the solution of the aries problem.—ED.)

Biochemistry of the Teeth. Henry M. Leicester, Ph.D. Professor of Biochemistry, College of Physicians and Surgeons of San Francisco. St. Louis: C. V. Mosby Company, 1949.

More than a thousand references dealing with the biology and pathology of the tooth are cited, and the material is condensed into an understandable digest of current thought. The chemical composition of the tooth, its physical properties, its manner of formation, the relationship between mineral

metabolism and the tooth development and structure, the effect of vitamins, hormones and other substances on developing teeth, the reactions of teeth after formation and eruption, and the nature of dental caries are discussed. The approach to this study is thorough and sane. Both confirmatory and contradictory or incomplete evidence to support the various hypotheses relating to the physiology and the pathology of the tooth are cited. The reader who looks for a final word on the prevention or cause of tooth decay will be disappointed. As a part of his final summary the author states, "thus the process of caries is very complex, involving the interplay and interaction of a great many different factors, no one of which can be considered the cause of caries, yet any one of which may be decisive in the progress or prevention of the condition". He emphasizes that either or both of two major agencies may be effective in the initiation or progression of tooth decay. One of these is the external environment of the tooth, including the types of bacteria present and the substrate for their growth; the other is the morphologic and histologic state of the tooth itself, which is determined largely by the developmental history of the individual tooth. He fails to enlarge on an important factor in the state of the tooth in relation to its ability to withstand decay, even though its nature is discussed in another section of the book, namely, the degree of ability of the tooth to develop sclerotic dentin as a barrier to the inroads of caries.

As a reference work and as a source of basic information, this book can fill a valuable place in the library of the physician or other worker in the field of health and disease.

A Correlation of Recent Research in Dental Caries. *L. S. Fosdick, Northwestern University Dental School, Chicago, Ill.* New York J. Dent. 18: 55-60, Feb. 1947.

The doctrine is expounded that the immediate destructive mechanism in dental caries is acid decalcification of the inorganic structure of the teeth, accompanied or followed by putrefaction of the organic portions. Systemic conditions affect the process by altering these local factors. Of the substances in the saliva which could cause decalcification, the most likely is an increase in hydrogen ions. The chemical composition of normal saliva is quite variable, but saliva from caries-resistant mouths tends to have greater buffering capacity or CO_2 combining power, is more highly supersaturated with calcium and phosphate ions, and has slightly more ammonia than saliva from susceptible mouths. Furthermore, saliva from caries-resistant mouths does not contain or will not support the growth of *Lactobacilli* as well as saliva from susceptible mouths, and in the presence of sugar will not permit the formation of acid as rapidly. Most dietary studies have suggested that caries is related in some way to the liberal ingestion of sugar. *Lactobacilli*, streptococci, leptothrix and practically every other aciduric oral organisms have been held responsible by different workers for dental caries. No matter what the organisms are, the decalcification is due to acid. Curiously, none of

the organisms thus far investigated has been capable of forming acids under laboratory conditions as rapidly as it forms in the mouth. The oral environment, with so many different kinds of bacteria growing in symbiotic relation, seems to possess the enzymes necessary for the various reactions in optimal concentrations. Some of the enzymes or coenzymes necessary for the degradation of sugars may be nutritional necessities for *Lactobacilli*.

Whether caries will develop seems to depend upon two primary variables: (1) the rate of acid formation in the so-called susceptible areas, as balanced against (2) the rate at which these acids are neutralized. In the light of this concept, acids which form more rapidly than they can be neutralized by the saliva will eventually be neutralized by the tooth substance, with caries as the result. If the acids are formed slowly and are neutralized rapidly, then a true resistance to caries is in effect, and a high sugar diet may be consumed without causing caries. A number of variables related to food, saliva and teeth determine whether the teeth are bathed in an acid medium. The carbohydrate from which the acids are formed is not derived from the saliva but from that portion of the diet which remains in the mouth after the food is swallowed. There is a fairly accurate correlation between the buffering capacity of saliva and caries activity. If the buffering capacity of the saliva is high, less caries is generally observed. A diet rich in fresh fruits and vegetables discourages the development of caries. Success has been obtained experimentally in the control of dental caries by decreasing the rate of acid formation. A curtailment of fermentable sugars and carbohydrates in the diet results in decreased caries activity. It would appear that a carbohydrate-free diet will always result in caries resistance. The best experimental results have been obtained by measures which seem to interfere with the enzyme system involved in the degradation of carbohydrates. If fluorides are present, the rate of acid formation is materially decreased. Other enzyme inhibitors are said to be colloidal silver, zephiran, 30% urea, and urea-quinine mixtures. Where these have been tried, caries activity as determined by the *Lactobacillus* count has been markedly reduced. Another inhibitor is synthetic vitamin K. One important factor, still ambiguous, is the nature of the different caries pattern in vital teeth as compared with non-vital teeth and those with opalescent dentin.

The author suggests that tooth-lytic processes can be minimized by proper oral hygiene after each meal. He comments also that "if a completely non-toxic, tasteless, stable inhibitor could be incorporated into all sugar at the point of manufacture, a truly mass control of dental caries could probably be attained." 19 references.

(Dr. Fosdick's report is limited to one field of dental research. Many of the statements expressed are still highly controversial. Much more carefully controlled experimentation is needed to establish the validity of the fundamental assumptions and the many facets of this theory.)

*A review of the background of the work which has led to the acceptance of the *Lactobacillus* theory is in order. In 1925 Bunting and his associates*

directed attention to the fact that tooth scrapings from persons with progressive dental caries contained many bacteria belonging to the *Lactobacillus* germs. Jay and his associates at the University of Rochester drew similar conclusions. Jay later became identified with the Michigan group, and the workers in their group have made several reports which support the following contentions: *Lactobacilli* accompany or are forerunners of tooth decay. Their appearance may precede the development of new cavities by two or three months. Persons with freedom from caries tend to have low numbers of such organisms; bacterial multiplication heralds the approach of caries activity. By reducing the refined sugar content of the diet, the counts decline and tooth decay lessens or becomes inactive. Persons who do not harbor the *Lactobacilli* in their mouths are caries-resistant, and their blood tends to carry an increased titer of antibodies to that organism. Vaccination with dead organisms sometimes leads to a high antibody titer, as shown by Jay Williams, but the rise in titer has no significant influence upon the salivary *Lactobacillus* count. From these generalizations it is suggested that the *Lactobacillus* count provides a dependable index of the activity of tooth decay in a given mouth, and can be used as a basis for prognosis as to what will happen in the near future. A number of state and other laboratories have been set up to provide practicing dentists with *Lactobacillus* counts from samples of saliva sent to them.

A review of the original papers reveals no data as to the number of newly carious areas for given subjects over fixed and significant periods of time, nor are accessory factors controlled sufficiently that quantitative impressions from the data, other than the magnitude and the variability of the observed *Lactobacillus* counts, can be drawn. Because of the importance of determining the degree and the constancy of truth of the *Lactobacilli*-caries concept, the need for further studies in which all variables are better controlled, and in which data which fail to conform with this premise are given as great or even greater consideration is imperative. This is especially important, inasmuch as many suggestions for caries control rest not on dental findings but on the results of bacterial counts.—ED.)

B. Carbohydrates Plus *Lactobacilli* as Destructive Agents

Correlation of *Lactobacillus* Counts with Caries Extent in an Institutional Population. *Julian D. Boyd, Virgil D. Cheyne, D.D.S. and Kenneth E. Wessels, D.D.S., College of Medicine and College of Dentistry, State University of Iowa, Iowa City, Iowa.* Presented before International Society for Dental Research, Rochester, N.Y., June 19, 1948.

Lactobacillus counts from the saliva of more than 200 institutionalized children have been made in a State Laboratory by personnel especially trained to provide such service to the dentists of the state. Duplicate analyses of samples collected within 24 to 48 hours were made with most subjects. All samples were collected before breakfast, after chewing

paraffin. The individual *Lactobacillus* counts were correlated with the extent of tooth decay (DMF surfaces), the rate of progression of tooth decay during the previous 9 to 12 months, and the status of mouth hygiene. No significant correlation was evident except with the habitual and the current state of oral hygiene.

Correlation Between Acidophilus Counts and Rates of Caries Progression. *Julian D. Boyd, M.D., Kenneth E. Wessels, D.D.S. and Virgil D. Cheyne, D.D.S., Ph.D.* Presented before the International Society for Dental Research, Chicago, Ill., June 24, 1949.

As a part of a larger study, serial *Lactobacillus* counts from the saliva of 64 teen-aged girls have been compared with the rates of progression of tooth decay, observed for not less than 30 months for each subject. There was little difference between the range of *Lactobacillus* counts among the subjects with the least and those with the greatest progression of tooth decay. Eleven of the girls had no advance of caries throughout observation. The median number of organisms for each cubic cm. of saliva from these girls was 70,000; for 15 girls with the most rapid advance of caries it was 80,000; for the group as a whole it was 72,000; for 15 girls with the most rapid advance of caries it was 80,000; for the group as a whole it was 72,000. The decile ranges showed even less difference in most instances. Thus, for one-sixth of this group of subjects the counts failed to give dependable information as to the prospective advance of tooth decay, nor were they distinctive within any subgroup as to the amount of advance of caries usually expected.

The Physical Consistency of Food and Refined Carbohydrate Restrictions: their Effect on Caries. *Herman Becks, M.D., D.D.S., College of Dentistry, University of California, J. Dent. Research 27: 405-10, June 1948.*

The author reviews the work of Jay and his colleagues on the coincidence of *Lactobacilli* and active tooth decay, and his own plan to test the Michigan Group's premise that reduction of caries activity can be brought about through reduction of the refined carbohydrate intake, the latter being associated with reduction of the *Lactobacilli* count of the saliva.

The first study describes the *Lactobacillus* counts from 1250 individuals who had rampant caries. The subjects ranged in age from 4 years to 60 years; half were 18 years old or younger. About 90% of these persons had counts in excess of 300 colonies to the cc. of saliva; in 88% the counts ranged from 1000 to 1 million. These values were contrasted with the counts from 265 persons said to have been caries-free; it is stated that only about 18% had high counts. More than half of those with no caries but with high counts developed dental decay soon afterward.

The second study dealt with the successive counts of 790 individuals during the course of a year, in which the excessive use of refined sugar and flour products was prohibited. Fresh fruit was allowed only once daily;

canned, dried or stewed fruit was prohibited. A very high proportion of the calories had to be replaced by other foods, with especial emphasis on proteins. This elimination and substitution program, when followed to the letter, led to immediate and drastic reduction in the counts. For about one-third of the subjects the values are said to have dropped to zero and remained there for the year. Another one-third approximated similar levels. Thirty per cent of the subjects evidently did not respond similarly. Careful dental examinations were made at the beginning and the end of the year of study. It is stated that in two-thirds of the subjects, no new cavities developed during the course of the year. The need for cooperation from the subject and the difficulty in maintaining it, especially among children, is stressed.

The author cites a third study, reported by him in 1942. It dealt with 99 students who were "caries inactive" and never had any caries experience, versus 107 students of comparable age, sex, environment and occupation who "were extremely caries active". Detailed diet records are stated to show little difference as to the adequacy of diet of the contrasted groups; the former group, however, consumed an average of 10 teaspoonfuls of sugar daily as contrasted with an average daily intake of 18 teaspoonfuls by the latter group. Although no direct statement is made, he implies that the lower counts are attributable to the difference in level of sugar consumption.

(These subjects, according to the author, had rampant caries at the beginning of the controlled study. From that statement one may assume that most of the tooth areas which were already susceptible to caries had been attacked prior to the study. He speaks, for example, of subjects who had developed 10 or more cavities during the preceding year. Such being the case, it could be predicted mathematically that with passage of time the incidence of newly attacked teeth would become less and less, regardless of the regimen under investigation. Whatever the merits of the author's conclusions may be, his choice of sample was such that the data as presented do not establish his contentions. In the reference to the 1942 study, certain individuals are referred to as "caries active" or "caries inactive", not on the basis of their dental observations, but from the levels of the Lactobacillus counts.—ED.)

Epidemiologic Studies in Dental Caries: 1. The Pattern of Dental Caries in Iowa City Children. *Julian D. Boyd, M.D. and Virgil D. Cheyne, D.D.S., College of Medicine and College of Dentistry, State University of Iowa, Iowa City, Iowa. J. Pediat. 29: 157-76, Aug. 1946.*

The serial dental records of 60 boys and 41 girls have been reviewed to determine the course of tooth decay in a presumably representative child population. The records were drawn from the files of the Children's Clinic of the Iowa College of Dentistry. Each child included in the study had been examined at least six times during a period of not less than three years. At each visit to the clinic the necessary reparative dental therapy had been

performed. Technics of examination and of recording had been constant throughout the study. Despite the recurrent dental care, caries had progressed practically without exception. In 76% of the children the average annual increment of newly carious tooth surfaces was not less than $2\frac{1}{4}$, and the median value was 3.8 surfaces. In contrast to this evidence of progressive tooth destruction during the course of study, only one permanent tooth was lost because of decay among all the children. Much individual variation was noted as to caries progression, not only among subjects, but in the course of the same child at different segments of his period of observation. Children with the least amount of caries at their initial examinations showed greater inconstancy as to their subsequent caries pattern than those with a high initial caries incidence. Those initially in the inter-quartile zone showed greater tendency to remain in that position than to shift to another quartile rank. The type of study did not permit much analysis of factors which might have contributed to the nature or to the variability of the dental response. Most of the subjects had always lived in Iowa City, where the drinking water does not contain significant amounts of fluoride. It may be concluded that recurrent dental therapy does not of itself prevent the development of tooth decay. The low incidence of tooth loss, however, speaks for the protective effect of reparative dental treatment. The study emphasizes the unreliability of data based on short-term periods of observation as evidence of the efficacy or inefficacy of specific caries-affecting agents. The data indicate that it may be more profitable to employ as experimental subjects those children whose past caries experience places them in the median group, rather than to choose a random sample of subjects without regard to their earlier caries course. 8 references. 4 tables. 5 figures.

Epidemiologic Studies in Dental Caries. 11. The Incidence of Caries Among Institutionalized Children. *Julian D. Boyd and Virgil D. Cheyne, D.D.S., College of Medicine and College of Dentistry, State University of Iowa, Iowa City, Iowa.* J. Pediat. 31: 306-21, Sept. 1947.

The incidence and extent of dental caries have been measured in 619 children in 6 custodial institutions. Among the younger children the caries scores were higher than in a public school; for teen-aged subjects who had been long term residents of the institutions the caries scores were significantly less than for the control group. No sex differences were noted. There was no relationship between the amount of prophylactic or therapeutic dental care and the respective caries scores. Fluoride ingestion played no apparent role in the collective caries patterns.

The data support the thesis that regimentation of living conditions in itself may modify caries experience, without evident relation to intra-oral environmental factors. Constancy of diet pattern, regularity and constancy of food intake, and freedom from certain emotional stresses may be significant. The diets employed did not meet optimal nutritional standards,

but they were better and more constantly dependable in certain regards than those ingested by the average child. They provided notable proportions of the total calories as starch and sugar. This study is one of a series dealing with dental findings among specific groups of children, each living under such environmental conditions that certain of the variables encountered in the general child population can be eliminated from consideration. The complete series is planned ultimately to offer evidence as to the role various factors may play in the epidemiology of dental caries. 11 reference. 9 tables.

Production of Dental Caries: A New Hypothesis. *P. Pincus, Middlesex Hospital, Middlesex, England.* Brit. M.J. 2: 358-62, Aug. 13, 1949.

Earlier work is cited to indicate that the protein of enamel and dentin is a mucoprotein. Through the action of gram-negative bacilli commonly found in the mouth, the liberation of the enzyme sulfatase has been demonstrated. This enzyme, acting on the sulfur-containing protein, can release sulfuric acid. The proteolysis leads to destruction of the organic matrix and the transformation of the inorganic salts to calcium sulfate. On the basis of his hypothesis, the author believes that dental caries can be caused by any organism which can release sulfatase, and that not a specific organism but specific enzymes instead, such as sulfatase, are responsible for tooth decay. He objects to the concept that the *Lactobacillus* is the causative agent, and offers reasonable arguments to support his contention.

Developmental Opacities of Teeth in a New England Community. *V. O. Hurme, Forsyth Dental Infirmary for Children, Boston, Mass.* Am. J. Dis. Child. 77: 61-75, Jan. 1949.

Opaque defects of the "white spot" type in the permanent teeth are common in the population of New Haven, Conn. One or more teeth with distinct "white spots" in the enamel were found in 142, or 83.5%, of 170 persons examined. No "mottled enamel" of the undisputed variety attributed to chronic dental fluorosis was encountered. In this geographic region there is a negligible amount of fluorine (less than 0.25 part per million) in the public water supplies. These data are of particular interest in view of the current belief that opaque defects of enamel are of common occurrence only in regions of endemic fluorosis. It is of interest that of 70 teeth with pigmented opacities, 88.6% belonged to persons who had roentgenographic evidence of either definite or questionable rachitic stigmas in their pelvic bones or dental evidence of spasmophilic episodes during the development of their permanent teeth.

There is an acute need for a reconsideration of the classification of enamel hypoplasias. Experimental study of the physiology of the dental pulp is needed before the diagnostic significance of opacities of the teeth can be fully understood. 26 references.

C. Fluoride and Caries

Fluorine and Other Trace Elements in Nutrition. *F. J. McClure, Ph.D., National Institute of Dental Research, National Institutes of Health, Bethesda, Md. J. A. M. A. 139: 711-16, Mar. 12, 1949.*

This authoritative review was prepared for and sponsored by the Council on Foods and Nutrition of the American Medical Association. Pertinent excerpts follow.

"No foodstuff in the average American diet can compare with drinking water containing 1.0 part per million or more of fluorine as a source of fluorine in human nutrition, but it cannot be said at this time that fluorine is an essential trace element even for purposes of dental health. Although it may become a recommended procedure to supplement children's diets with an optimum quantity of fluoride, wherever a fluoride drinking water is not available, present evidence does not justify dietary addition of fluorine.

"Fluorine research has afforded a striking demonstration of the relatively narrow margin of physiologic benefit and physiologic toxicity which characterizes many trace elements. Optimum effects of fluorine on dental caries, thus, are associated with 1.0 part per million of fluorine in the drinking water, whereas 1.5 parts per million or slightly more fluorine is the beginning level of endemic dental fluorosis . . .

"Whereas inhibition of caries has been demonstrated conclusively for 12 to 14 year old children continuously exposed to fluoride waters, only a few studies apply to older persons . . .

"Experimental results give consistent support to the human caries-fluoride relation: (1) induced experimental caries in small animals is fluoride inhibited; (2) dental tissues contain fluorine which may be classified as primary fluorine acquired during growth and calcification of the teeth, secondary fluorine acquired after tooth eruption, and adsorbed secondary enamel fluorine, acquired possibly by local oral enamel surface adsorption; (3) reduced solubility and surface changes in enamel and dentin are attributed to fluoride reactions on dental tissues *in vitro*; (4) fluoride may affect oral bacterial activity and exert anti-enzymatic effects possibly involved in causation of dental caries, and (5) the ameloblasts (enamel-forming cells) are extremely sensitive to fluorine . . .

"The remarkable caries-preventive results obtained by topical application of fluoride suggest a change in enamel surface *in vivo*, due possibly to acquisition of additional enamel fluorine, via surface acquisition of additional enamel fluorine, via surface adsorption. Analytic procedure thus far has failed, however, to demonstrate any increased fluorine in topically treated teeth . . .

"Because fluorine is a powerful anti-enzymatic agent it is suggested that fluorine in the teeth acts anti-enzymatically. There is little or no evidence *in vivo* to support this idea. The effect of fluorine on salivary amylase seems inconsequential, and fluorine in saliva is not correlated with ingestion of fluorine . . .

"The idea is erroneous that edible foods grown in areas where fluorine in the local water is above normal are high in fluorine content . . . The tea leaf and certain sea foods are exceptionally high in fluorine, but in general no raw foods can be implicated in the causation of fluorosis or in the "fluoride prevention" of dental caries. Small increments of fluorine may be added to certain foods when they are cooked in fluoride waters . . . All the evidence reveals no elevation of fluorine in cows' milk due to additional fluorine in the ration of drinking water. It should be emphasized, certain industrial exposures being disregarded, that water-borne fluorine is the major fluorine exposure associated with human population groups . . .

Data gathered by McClure and Kinser indicate that "upward of 90% of water-borne fluorine (in concentrations of 0.5 to 4.5 parts per million of fluorine) is eliminated in the daily urine of teen age boys and young men . . . Although further studies of population groups exposed to fluoride waters are undoubtedly desirable, it seems unlikely that prolonged ingestion of fluorine via a domestic drinking water containing 1.0 to 1.5 parts per million of fluorine, or perhaps more, presents a public health hazard." 107 references. 2 figures. 1 table.

Fluorine in Foods; Survey of Recent Data. *F. J. McClure, Ph.D. National Institute of Dental Research, National Institutes of Health, Bethesda, Md. Pub. Health Rep. 64: 1061-74, Aug. 26, 1949.*

From a survey of recent analytical data for fluorine in foods, it would appear that the majority of foods in the average diet contain 0.2 to 0.3 p.p.m. or less fluorine in the food as consumed. Tea, however, contains upward of 75 to 100 p.p.m. fluorine in the dry tea, and sea foods may contain 5 to 15 p.p.m. Cow's milk contains about 0.1 to 0.2 p.p.m. fluorine. Fluoride added to the cow's ration or drinking water has no influence on the milk-fluoride. Fluorine in soil and water has little or no influence on the fluoride content of edible plant produce. Although the data are limited, it appears that natural food-borne fluorine is largely available for body assimilation. Thus the average diet appears to provide 0.2 to 0.3 mg. of fluorine daily, exclusive of drinking water. 41 references. 2 tables.

Toxic Level Of Fluorine In Water Supplies. *Demarious C. Badger, Hobbs, N. Mex. Am. J. Dis. Child. 78: 72-76, July 1949.*

From the high incidence of stained and imperfect teeth in his practice in Hobbs, New Mexico, the author is convinced that "dental fluorosis does occur at a fluorine level of 0.9 p.p.m., and extraneous factors are probably no different here than in other sections of the country." Fluorine occurs in the water in Hobbs in a concentration of 1 p.p.m. It is pointed out that the climate there is hot and dry, which favors the consumption of unusual amounts of water. Furthermore, the increasing use of fluorine sprays for fruit trees augments the possibilities for ingestion of fluorine. The damage from the ingestion of fluorine is stated to occur during the calcification of the secondary teeth during the first six years of life (with the exception of the second and third molars). "If fluorine is added to the municipal water

supplies, the level should be lowered to 0.7 p.p.m. If the level of fluorine is above 0.7 p.p.m., then children under 3 years of age, and preferably under 6, should use filtered or distilled water in order to prevent a defect in the permanent teeth which are forming during these years." 6 references. 1 figure. 1 table.

Fluoride Therapy for the Control of Dental Caries. *Francis A. Arnold, Jr., D.D.S. Experimental Biology and Medicine Institute, National Institutes of Health, Bethesda, Md.* J. Am. Dent. A. 37: 433-37, Oct. 1948.

The accumulated evidence to date on the fluoride-dental caries relation suggests three different avenues of attack which are feasible: (1) adjusting the fluoride concentration in public water supplies to an optimal level; (2) topical application of fluoride solutions to the erupted teeth; (3) increasing fluoride ingestion through daily supplements to the diet. An appreciable series of epidemiologic investigations with naturally fluorinated waters are on record. The first investigation, made in Galesburg, Quincy, Monmouth and Macomb, Illinois indicated that children born and reared in a community using a domestic water supply containing fluorides experienced only about one-third as much dental caries as children receiving a fluoride-free water supply. Mottling of the teeth by dental fluorosis did not seem necessary for the inhibition of dental caries. Late investigations in 27 communities have demonstrated an inverse correlation between the fluoride content of domestic water supplies and the prevalence of dental caries. The correlation appears to exist regardless of the sources and character of the water supply, whether the water is from a surface or well supply, or is soft or hard. Also, the results establish an optimal concentration, 1 part per million, of fluorine. With this concentration in the water supply, caries experience is practically the same as is found with 1.8 to 2.5 p.p.m. With higher concentrations of fluoride, dental fluorosis becomes a significant public health hazard.

At the present time, numerous studies are being conducted to test the hypothesis that dental caries can be controlled partially by artificial fluorination of domestic water supplies. One of the first of these studies was started at Grand Rapids, Mich., in January, 1945 under the supervision of the U. S. Public Health Service in cooperation with the Michigan State Health Department and the University of Michigan. Annual dental and bacteriologic examinations have been made since the autumn of 1944, prior to inauguration of fluorination. Since it is probable that a fluoride water must be ingested during the formative period of the tooth in order to be beneficial in relation to caries, a change in dental caries in these communities would not be expected until at least five or six years after fluorination is begun. So far in the Grand Rapids project there has been little difficulty controlling the concentration in the water supply at 1 p.p.m. of fluoride with very slight variation. The cost of this treatment is nominal when compared to the present day cost of treating caries; at present the cost of fluorination in Grand Rapids is about 10 cents per person per year.

Following the reports of decreased caries in endemic fluorosis areas, laboratory research centered on the action of fluorides on dental tissues. It was soon demonstrated that the acid solubility of enamel and dentin was decreased materially after exposure to various fluoride solutions. Experiments on guinea pigs and hamsters demonstrated some reduction in caries after topical applications of sodium fluoride solution. During the past few years a number of clinical trials have given evidence of a reduction in dental caries in children after topical application of fluoride solutions. For example, Knutson and Armstrong, using a large group of school children 7 to 15 years of age, applied a 2% solution of sodium fluoride to the teeth on one side of the mouth 8 to 15 times in a two month period. A 40% reduction in caries incidence occurred on the treated side of the mouth during the first year of operation, and a reduced incidence was observed for as long as three years following the original series of treatments. A later study by Galagan and Knutson with 807 school children 7 to 15 years of age demonstrated that 4 applications gave almost twice as much reduction as 2 applications, and 6 applications were no better than 4. In these studies the teeth were thoroughly cleaned prior to the first application, at least. Omission of the prophylaxis decreased the effectiveness of the treatments about 50%. There are 3 reported studies in which no reduction in caries incidence followed topical applications of fluorides. In 2 of these the number of observations was too limited for statistical significance. The results of the third study are not directly comparable with reference to age groupings, and only one fluoride treatment was given.

Dietary supplementation with fluorides is the third method suggested for caries control. Supplements can be given in the form of tablets or solutions containing fixed amounts of fluorine salts or by means of substances such as bone meal of which some types contain appreciable amounts of fluorides. Very little direct evidence is available to evaluate this procedure.

The mechanism of caries reduction by fluorides is not well understood. The epidemiologic evidence suggests that the fluorides must be available during the formative period of the tooth. The results of topical application suggest the possibility of the more concentrated fluorides affecting the surface environment of the tooth, though knowledge is lacking as to whether such a change is brought about. The best hypothesis, in the author's opinion, is that of Hodge and Sogmaes, "Fluoride is adsorbed or bound in combination in enamel or in dentin and, probably of most importance, on the surface of the tooth, thereby: (1) lowering the solubility of the calcified part; (2) giving a relatively high local concentration of fluoride which inhibits those bacterial or enzymatic processes that otherwise are believed to dissolve the protein and the calcified material; (3) changing the salivary milieu as shown by the lower *L. acidophilus* counts." 27 references.

(Concentration of 1 p.p.m. of fluoride in the drinking water, or the repeated topical application of a 2% solution of fluoride after a dental prophylaxis reduces the prevalence of caries. From the public health

standpoint, the addition of fluoride to drinking water may be of great importance. The results of the many studies with this procedure now under way are awaited with interest, particularly by the pediatricians. A number of communities in the United States and Canada have begun to add or are considering an addition of fluoride to the public water supply to a fluoride content up to 10 to 12 p.p.m. Among these communities are the following: Pratt and Ottawa, Kansas; Burlington, Shelboigen, Elkhorn, Janesville, Madison and Wisconsin Rapids, Wis.; Grand Rapids, Escanaba and Midland, Mich.; Marshall, Texas; Evanston, Ill.; Belchertown State School and Wrentham State School, Mass.; Lewiston, Idaho; Flint, Mich.; Rochester, Minn.; Garrettsville, Ohio. Public health authorities have swung behind the fluorinization program and at the moment are stressing it because of the low cost and possible mass attack, to the practical exclusion of all other procedures of caries control.—ED.)

To What Extent Does Fluorine Ingestion Lessen Tooth Decay? *Julian D. Boyd, M.D. and Virgil D. Cheyne, D.D.S., College of Medicine and College of Dentistry, State University of Iowa, Iowa City, Iowa. J. Pediat. 29: 268-94, Sept. 1946.*

The incidence and extent of dental caries has been studied among Iowa children in relation to the prevalent level of fluoride in the respective domestic water supplies, and in regard to the presence or absence of mottling of enamel. Qualitatively the data confirm other reports that fluoride ingestion tends to lessen the community incidence of caries. Quantitatively, however, notable amounts of caries were observable among numerous subjects presumably ingesting significant amounts of fluoride routinely, and among children with mottling of enamel. There was no good evidence that caries was lessened among subjects who had no mottling of enamel but who were currently ingesting water with presumably therapeutic levels of fluorine content. The constancy of the therapeutic value of fluorine ingestion remains to be demonstrated, especially as it relates to teeth already erupted. There is no reason to conclude from any studies thus far reported that teeth undergo decay primarily because of inadequacy of fluoride ingestion. The ultimate answer to caries control may well lie in the furtherance of other innate physiologic protective agents. 11 references. 6 tables.

Sodium Fluoride Solutions: Technic for Application to the Teeth. *John W. Knutson, Dental Public Health Section, U. S. Public Health Service, Washington, D. C. J. Am. Dent. A. 36: 37-39, Jan. 1948.*

The first step in the technic of application of sodium fluoride to the teeth as a prophylactic measure against caries consists of thorough cleansing of the coronal surfaces of the teeth. Only the first in the series of four applications need be preceded by dental prophylaxis. The cleansed teeth are first blocked off or isolated with No. 2 cotton rolls, and then dried with compressed air. A 2% solution of sodium fluoride (C.P. sodium fluoride in distilled water) is then applied to the dried enamel surfaces; a cotton applicator or light spray may be used for this. The solution should wet

visibly all surfaces, including the interproximal surfaces. It is permitted to dry in air for approximately three minutes. The mouth may then be rinsed with water, though this is not essential. The second, third and fourth applications of sodium fluoride are made similarly, at intervals of approximately one week. It is suggested that a series of applications be given at the ages of 3, 7, 10 and 13 years. These ages should be varied in accordance with the tooth eruption pattern of the individual child. One series of treatments at 3 years of age would provide protection for the deciduous teeth. Subsequent treatments would provide protection for the permanent teeth during the period of changing dentition: the incisors and first molars at age 7, the bicusps and cuspids at age 10 and the second molars at age 13. 4 figures.

Topical Fluoride Treatment Approved. *News Letter, Council on Dental Health, American Dental Association*, 4: No. 1, Jan. 23, 1948.

"The Council on Dental Health of the American Dental Association is of the opinion that there is sufficient scientific evidence to justify the use of topical fluoride treatments to reduce the incidence of dental caries in children . . . The Council also is of the opinion that topical fluoride therapy should be used routinely in private dental offices and in school and community dental health programs . . . Therefore, the Council on Dental Health recommends that an active campaign be inaugurated to inform dentists of the known facts and to encourage state and local councils on dental health to study the possibilities for making topical fluoride treatments available to all children."

The Effect of an Acidulated Fluoride Mouthwash on Dental Caries. *J. F. Roberts, B. G. Bibby and W. D. Wellock, Tufts College Dental School and the Massachusetts Department of Public Health, Boston, Mass. J. Dent. Research* 27: 497-500, Aug. 1948.

The effect of a pH 4 mouthwash used twice a week was tested for one year on sixth grade children in Massachusetts. The 187 children using an acidulated sodium fluoride mouthwash had a caries attack rate more than 30% higher than 169 children using an acidulated fluoride-free mouthwash. This adverse effect of fluoride treatments may have resulted from the acidulation. 9 references. 1 table.

D. Control of Caries by the Dentist

Treatment with Sodium Fluorides Approved. *Resolutions passed at the 46th Annual Conference of State and Territorial Health Officers*, Dec. 1947.

Recommendation 10 — Inclusion in Health Programs:

That all public health dental programs should include the topical application of sodium fluorides as a prophylactic measure.

Recommendation 11 — Sodium Fluoride A Preventive Measure:

That topical use of sodium fluorides is a preventive health measure.

It should be available to all children of specified age groups in any area where a program is developed.

Recommendation 12 — Training Personnel:

That auxiliary personnel be trained to assist in this program.

Recommendation 13 — Rigid Adherence To Technic:

That a technic which has been adequately tested should be rigidly followed.

Recommendation 14 — Continuation of Water Supply Studies:

That it is recommended that studies be actively continued in the use of sodium fluoride in public water supplies or other vehicles.

(The Supplemental Federal Security Agency Appropriation Bill, Fiscal Year 1949, made a considerable sum available to the Public Health Service to conduct a nation-wide topical fluoride demonstration program. This program is now under way. Demonstration teams consisting of a dentist, two hygienists and a clerk, supplied with portable equipment and an automobile, have already started to work.—ED.)

Present Status of Preparations Used in Impregnation for Caries Prophylaxis. *Statement of the Council on Dental Therapeutics, American Dental Association.* J. Am. Dent. A. 38: 147-48, Jan. 1949.

Commercial houses have recently marketed certain preparations for the control of dental caries by chemical impregnation of the tooth structure. These preparations are based on the hypothesis that the initial carious lesion is primarily proteolytic in character and is aided by an invasion of micro-organisms into the lamellae or prism sheaths of enamel. If the hypothesis is correct, caries could be prevented by mechanical obstruction of these invasion roads. Contrary to this theory is experimental evidence that the initial carious lesion is the result of an acid environment (decalcification) of the surface enamel. As far as the Council can ascertain, the effectiveness of preparations that have been suggested for use in impregnation has not been established to date. 9 references.

(Clinical trials of dentifrices and mouth washes containing urea or dibasic ammonium phosphate, singly or mixed, have not progressed far enough to demonstrate that their use will reduce dental caries. The early reports are encouraging. The above formula for a dentifrice is reproduced here for the information of any who may care to try it. Formulas for other similar preparations can be found in the paper by Kesel et al, Am. J. Orthodont. & Oral Surg., 33: 80, 1947, or in the J.A.D.A. 36: 504, June 1948. Some commercial manufacturers have already embarked on campaigns to promote ammonium-containing toothpastes and powders for the laity. At the June 1949 meeting of the International Association of Dental Research, Dr. Gustav W. Rapp and Mr. B. F. Gurney of the faculty of Loyola University's dental school described a new chlorophyll containing dentifrice (sodium copper chlorophyllin) for which sensational claims are already being made. These researchers are quoted as reporting that the new dentifrice lowers the Lacto-

bacilli count better than any other known substance, inhibits pathogenic bacteria and proteolytic enzymes, and deodorizes the mouth as well. Drs. John W. Hein and William G. Shafer of the University of Rochester reported at the same meeting that sodium copper chlorophyll produces very encouraging results in controlling and preventing tooth decay. This promising possibility of the use of chlorophyll compounds in the control and prevention of caries is already being subjected to critical inquiry in a number of institutions, and may prove of general practical importance—ED.)

What is a Dental Caries Control Laboratory? *Caries Control Committee, School of Dentistry of University of Pennsylvania, Philadelphia, Pa. Bull. Philadelphia Co. Dental Soc. Nov. 1943.*

The School of Dentistry of the University of Pennsylvania recently opened a Caries Control Laboratory. Dentists of the area who wish to avail themselves of the services offered may procure diet plans for distribution to those patients whose salivary *Lactobacillus* counts are found to be elevated. In addition the Laboratory is prepared to offer the practicing dentist information as to techniques being used currently in the control of caries, such as the topical application of fluoride solution, the use of medicated dentifrices, calcium fluoride tablets or lozenges. Moreover the Laboratory is equipped to make estimations of the *Lactobacillus* content of saliva, and, where indicated, to make suggestions for reducing the number of such organisms. The laboratory is also conducting research relating to caries control.

Lactobacillus counts are recommended by the Laboratory personnel for patients with more than the average number of cavities, or with extensive or rampant progression of caries. The procedure is recommended on the premise that *Lactobacilli* usually are associated with caries activity and that with lessening of these organisms the caries progression rate may be expected to decline. The technic for collection of the sample is described. *Lactobacillus* counts of 0 to 1000 to the cc. are considered evidence of questionable caries activity; counts exceeding 10,000 are considered synonymous with marked caries activity. Two specimens, taken on successive days, are recommended. When diets low in carbohydrate content are prescribed because of high counts, five or more additional specimens are recommended, taken at proper intervals after instigation of the diet.

(Since high counts may be observed in some patients for long periods without initiation or progression of tooth decay, services such as described in this article must be considered as of an experimental nature, rather than as established guides toward diagnosis, prognosis and control of tooth decay.—ED.)

Methods for Controlling Dental Caries. *Memorandum, Caries Control Laboratory, University of Pennsylvania, School of Dentistry, Philadelphia, Pa.*

Topical application of sodium fluoride. The technic as described by J. W. Knutson (*J. A. D. A.*, 36: 37, Jan. 1948) may be followed (see page 36, this issue of *Quarterly Review of Pediatrics*).

Low carbohydrate-high protein diet. Before a low carbohydrate-high protein diet is prescribed, a *Lactobacillus* count should be made to determine whether a dietary change is indicated. The purpose of the diet is to reduce the number of *Lactobacilli*; if already low, a dietary change is not indicated except for a minimal sugar intake.

Dentifrice. Preliminary clinical studies indicate a reduction in number of *Lactobacilli* and maintenance of pH of the enamel plaque incompatible with enamel decalcification when dibasic ammonium phosphate and carbamide (urea) are incorporated in a dentifrice. To be effective, dibasic ammonium phosphate should be present in the amount of 5% and urea in the amount of 40% of the total mass. The following formula incorporates both these ingredients in the proper amounts:

	Parts
Carbamide (urea)	40.0
Calcium carbonate precip.	48.4
Dibasic ammonium phosphate	5.0
Bentonite	5.0
Oil peppermint	0.6
Oil cinnamon	0.3
Oil sweet birch	0.3
Oil clove	0.1
Saccharin	0.3

Sig.—Apply on tooth brush for 3 or 4 minutes. At night, brush teeth, rinse, and spread thin film of dentifrice on teeth. Most proprietary dentifrices contain less than the required amount of carbamide.

E. Nutrition and Dental Decay

The Reduction in Dental Caries in 5-Year-Old London School Children (1929-1947). *May Mellanby and Helen Mellanby*. *Brit. M. J.* 2: 409-13, Aug. 24, 1948.

On the basis of animal experiments and clinical studies in children, it has been found that well-calified teeth are less susceptible to caries. A prenatal and postnatal diet high in calcifying properties (calcium, phosphorus and vitamin D) is essential in the prevention or arrest of caries. Successive studies in 1929, 1943 and 1945 have demonstrated a progressive increase in the number of children with good dental structure and a decrease in the number with caries. The decrease in caries per child was greatest from 1945 to 1947 and was ascribed to the high calcifying properties of foods allocated to pregnant and nursing women and to children during those war years. 14 references. 7 tables.—*B. J. Shuman*.

Tooth Decay in Relation to Diet and General Health. *Nils P. Larsen, Honolulu, Hawaii*. *J. A. M. A.* 137: 832-36, July 3, 1948.

The author cites the relative incidence of dental caries among infants and children living on plantations in the Territory of Hawaii, and contrasts the incidence of decayed teeth with ethnic origin (Filipino versus native

Hawaiian), duration of residence in the Islands for the Filipino subjects, the state of general nutrition and the nature of the diet. He believes that diets consisting largely of taro and potatoes tend to be associated with slight caries incidence, whereas diets high in rice were eaten predominantly by those with more caries. The author assumes that the difference is due to the preponderance of alkaline ash in the former foods, and of acid ash in the latter foods. 31 references. 4 tables. 6 figures.

(So long as the causes of dental caries remain obscure, hypotheses such as the one proposed here cannot be brushed aside idly. From an extended study of native Hawaiian diet in relation to decay of children's teeth, Dr. Martha R. Jones noted similarly that this diet is extremely alkaline and is apparently compatible with excellent teeth. Larsen's observation is interesting; heavy carbohydrate eaters (Polynesians on taro) had excellent teeth, whereas other heavy carbohydrate eaters (Orientals on rice) had very poor teeth. His own explanation is that oxalates and fluorides, as well as the alkaline residue food values in the Hawaiian diet, might account for decay resistance in certain groups in Hawaii, and may be more important in preventing decay than climate, heredity, tooth cleanliness or specific food factors, including sugar. The need for critical objective studies is obvious.—ED.)

The Effectiveness of an Adequate Diet in the Control of Dental Caries. *Genevieve Stearns, Ph. D. University of Iowa College of Medicine, Iowa City, Iowa. J. Dent. Res. 27: 397-404, June 1949.*

Dental caries is a complex problem which probably will not be solved by any one method of control. If the incidence of caries is related to the state of nutrition, the greatest incidence of caries should appear during or shortly after periods of nutritional stress. Such stresses occur in illness, especially during chronic illness, even though of low-grade infections. They also occur during the period of rapid growth preceding puberty, during lactation, and after the menopause. The incidence of dental caries is increased at about puberty. The incidence at the other periods of stress could well be studied. Improvement of the diet in one respect only cannot be expected to bring improvement if the diet as a whole remains hopelessly below standard, or if the chief deficiency is other than the material supplied. The effectiveness of vitamin D in particular cannot be determined unless the calcium and phosphorus intakes are sufficiently high to permit an increase in retention through the action of the vitamin. When several factors of the dietary regimen have been altered, results cannot be ascribed to only one factor. This is the most common error in research reports.

At the State University of Iowa, keeping children under strictly controlled dietary regimens, caries has been completely controlled with diets high or low in sugar if they were nutritionally adequate and well-absorbed. The longer a child remains in a state of poor nutrition, the longer it takes for him to utilize a good diet. Many months must elapse before the child becomes well nourished. It is not diet but the state of nutrition which is the important factor in dental caries.

Dental Caries in Norwegian Children During and After the Last World War: A Preliminary Report. *Guttorm Toverud, Dental School of Norway, Oslo, Norway.* Proc. Roy. Soc. Med. 32: 249-58, April 1949.

Dental examinations of 8,000 to 9,000 school children from different parts of Norway were carried out each year from 1940 to 1948. The caries frequency decreased steadily from year to year during the war, the overall reduction in the number of carious tooth surfaces per child amounting to 50 to 75%. A study of 600 to 700 children, 2½ to 7 years old, showed an even greater reduction. In both groups the decrease was statistically significant.

From 1946 the caries frequency has increased again in the school children as well as in the pre-school children. The cause of the decrease in caries frequency during the war and the cause of the increase after the war is discussed. The tentative conclusion is that the decrease may be associated with the lowering in consumption of more natural foods, i.e., the protective foods. This may have resulted in the local factors which produce decay.

Analysis of Wartime Reduction of Dental Caries in European Children, with Special Regard to Observations in Norway. *Reidar Fauske Sognnaes, Harvard School of Dental Medicine, Boston, Mass.* Am. J. Dis. Child. 75: 792-821, June 1948.

The teeth of European children in all of the occupied and war-torn countries surveyed show a decrease in caries in the latter part of, and following, the recent wars. This is most significant in young children and in those teeth of older children which have developed or matured during the war years. Trends in this direction were noticeable in most of the European countries. Survey of the dietary intakes failed to establish a uniform increase in any specific food or food factor which can satisfactorily explain the marked reduction in caries or demonstrate the expected concurrent reduction in caries and sugar during the two wars. If *L. acidophilus* in the mouth were a conclusive factor in the production of caries, it is strange that a marked reduction in caries was not noted until approximately three years after the enforced reduction of sugar at the beginning of the two wars. If there is a causative relationship between the wartime reduction in dental caries and the reduction in the use of refined carbohydrates, it can best be explained by an indirect favorable influence on the development and maturation of the teeth, rather than by a change in the oral environment alone. The nature of the favorable influence is not known. It cannot be attributed to a uniform increase in the consumption of any previously demonstrated caries-preventing food or food factor. 53 references. 7 tables. 3 figures.

(Restriction of sugars often leads to increased intake of foods which probably are of more nutritional worth. Thus betterment of diet may explain the lessening of caries here reported. It must be recognized that caries

progresses at variable rates of speed, and that a variable period of latency intervenes before the specific effect of any imposed regimen may make itself apparent.—ED.)

The Influence of General Health Supervision on the Frequency of Dental Caries in Groups of Norwegian Children. *Guttorm Toverud, Dental School of Norway, Oslo, Norway.* Brit. Dent. J. 36: 191-97, April 14, 1949.

Diets of pregnant and lactating mothers and of their children were supervised in a rural Norwegian community from 1936 through 1940, and in one district of Oslo from 1939 through 1947 by activities of health stations. Effective measures were taken to bring the diets up to high standards of nutritional excellence. Intake of sweets and other forms of refined carbohydrates was kept at a low level. The Oslo study provided the larger number of subjects, whereas the rural study included a higher proportion of subjects followed from prenatal life. There was notable reduction of prematurity and of stillbirths among the mothers who received the diet supplements. The well-being of the infants also was better, as shown by lessened evidences of rickets and of nutritional anemia. Of the infants born to mothers under diet supervision (approximately 1500 in all), no instance of intracranial hemorrhage was encountered. Part of the neonatal routine was routine administration of vitamin K to all expectant mothers during the last three weeks of pregnancy.

The data from the rural community indicate that tooth decay among the children 2½ years or older was notably less in those born of mothers who had received diet supervision during gestation. In the Oslo study, because proportionately fewer of the mothers had been advised during gestation, distinction was made only between those children and mothers who had come under guidance before the child reached the age of one year and those who were older when seen initially. This was equivalent to comparison of dental response among those who had had diet guidance during the important period of pre-eruptive mineralization of the teeth and those who had not. There was significantly less caries among those who had been under diet guidance from earliest childhood. With increasing age this distinction became less. The author stresses the unfavorable effect which maternal and personal illnesses and nutritional deficiencies may play in the histologic picture of the child's teeth, and a corresponding increase in tendency toward decay. The opinion is expressed that diet regulation is the most valuable aspect of prenatal supervision as it relates to the subsequent health of the teeth. This dental benefit is accredited to an acquired pre-eruptive resistance of the teeth to decay. Lessening of the effectiveness of this resistance is considered due to the increase in caries-promoting factors within the mouth cavity as the child's later food habits become altered. Restriction of refined carbohydrates is thought to be but one of the important factors in the avoidance of decay.

A Dental Survey of Puerto Rican Children. *K. L. Shourie, J. W. Hein, S. W. Leung, N. S. Simmons, C. D. Marshall-Day, University of Rochester, School of Medicine and Dentistry, Division of Dental Research, Rochester, N. Y.*

The material contained in this report was gathered in Puerto Rico during the summer of 1948. The results are presented in 136 tables distributed among 6 chapters, each chapter containing a written summary of the findings. In addition, the original data for *Lactobacillus acidophilus* counts and diet surveys are set forth in detail in an Appendix, together with samples of the recording charts and IBM codes. The survey was designed to yield information regarding dental and oral conditions which would be of value for both research and public health purposes. To accomplish this, two types of oral examinations were employed. One was designed to give information of an epidemiologic nature; the other was especially planned to yield detailed data suitable for research studies. Approximately 3,000 children between the ages of 6 and 18 from six communities were examined for the incidence of dental caries and periodontal disease. Of this number, 622 were 14 year old boys who were studied in detail with respect to dental caries, periodontal disease, oral calculus, oral flora and many other factors. The data were mechanically tabulated by use of IBM punch cards. In order to obtain an accurate knowledge of Puerto Rican food habits, quantitative diet surveys of 15 families in each selected area were carried out. In all, 650 persons were so studied. The mean calorie intake ranged between 2317 and 3142. The calcium and vitamin A contents appeared to be below the recommended standards of the National Research Council. Intake of milk and milk products was relatively low and there was practically complete absence of leafy vegetables from the diets. The sugar intake ranged from 1.9 to 6.1 ounces per adult unit per day. Less than 1% of 1754 school and non-school children examined showed clinical signs of nutritional deficiency.

Detailed results of the caries study are presented in 51 tables. The mean DMF (Decayed, Extracted and Filled Teeth) rate for 2099 children between the ages of 6 and 18 was found to be 7.3, the boys showing a higher score than the girls at all ages. The 14-year old boys showed a score of 7.2 by clinical examinations alone but 8.4 when roentgen findings were included. Fillings were non-existent in the boys below the age of 12 years and in the girls below 10. Above these ages they were present in only small numbers. In the 14-year old boys 92.9% had one or more decayed teeth which required treatment. Tables are presented showing the incidence and severity of carious involvement not only for each tooth but for the various anatomic areas of each tooth. It was found, for example, that the first molars were the most frequently affected and that the lower first molars averaged larger cavities. In interproximal decay a higher percentage of contacting mesial and distal surfaces was involved than similar surfaces not in contact. Throughout the study, several criteria, such as DMF teeth, DMF areas and DMF surfaces were used for the evaluation of decay. Comparisons of these various criteria showed high degrees of correlation.

Certain factors, such as the length of residence in the examination area, the economic status and size of the family, the weight of the subject and the amount of tooth debris appeared to suggest some relation with the aries incidence.

Since previous studies have indicated that oral *L. acidophilus* may bear some relation to dental decay, saliva samples were collected from 564 fourteen year old boys. The *Lactobacillus acidophilus* counts of 312 duplicate samples sent to two laboratories showed a high coefficient of correlation measured by DMF teeth, DMF surfaces or number of open cavities. Correlation coefficients between *Lactobacillus* counts and the amount of gingivitis or the amount of debris around the teeth were also very low. The analyses of the data collected in reference to gingival pathology are presented in 39 tables. A total of 2265 children, 6 to 18 years old, were examined. In 1648 children examined for the incidence and degree of gingivitis, 67% to 85% of the boys and 59% to 74% of the girls showed gingival involvement. Both sexes showed the highest incidence of gingivitis at the age of 12 years, although for all ages the girls averaged less than the boys. Six hundred and twenty-two boys, 14 years old, were given a gingival examination which included an examination of each labial or buccal margin and papillae for the presence and degree of hyperemia, proliferation, edema, glazing and loss of stippling. Analysis of the data showed that proliferation tended to be generalized. The upper posterior gingivae were most frequently involved with gingivitis, while the lower posterior gingivae were least affected. Adjacent margins and papillae tended to be simultaneously affected by either hyperemia, proliferation or edema. No single region reflected the degree of involvement in the mouth as a whole, but the anterior region was found to be 90% accurate in reflecting cases of clinically normal gingivae in the whole mouth. Colored photographs were taken of the anterior region of the mouth of 622 subjects. These photographs were found to be of little value in either the qualitative or quantitative estimation of gingival pathology in the regions portrayed. The presence of supragingival calculus in 2265 children is also reported. The incidence of supragingival calculus was found to fluctuate with age and was highest in the 12-year age group. However, the incidence of subgingival calculus was found to increase with age. An abrupt increase in the incidence of subgingival calculus was found between the ages of 10 and 12 years in both sexes.

On the basis of examinations of 622 fourteen-year old boys, the percentage distribution of supragingival and subgingival calculus, according to the tooth affected, has been calculated. The upper first molars and the lower incisors were most frequently affected by either type of calculus. Only about one-third of these boys had no calculus.

An Evaluation of the Role of Vitamins and Minerals in the Control of Caries. *Wallace D. Armstrong, School of Medicine, University of Minnesota, Minneapolis, Minn. J. Dent. Research 27: 376-96, June 1948.*

It has been shown in experimental animals that deficiencies of either vitamin A, D, or C will result in defective tooth formation. Diets grossly inadequate in mineral elements may likewise produce deficient calcification in growing animal teeth, as well as changes in form and structure of the enamel and dentin. Considerable evidence has nevertheless accumulated that teeth do not always undergo changes in ash or calcium and phosphorus content under dietary regimens which produce marked changes in growing bone. There is also much evidence that teeth once formed are, in comparison to the skeleton, essentially beyond the influence of nutrition. The fact that small amounts of radioactive elements can make their way into the dentin and enamel of fully formed teeth should not be interpreted to indicate that the composition of these structures can be altered after the tooth is fully formed.

Review of the data of Mellanby, Day and other workers on the relationship between caries susceptibility and vitamin D intake in humans leads to the conclusion that teeth formed during a period of suboptimal intake, all other conditions being equal, possess an increased susceptibility to caries. Furthermore, if the intake of vitamin D is adequate and of the order of 400 to 800 International units per day, further supplements with this vitamin are not likely to be of value. Finally, vitamin D supplements do not appreciably affect the initiation or progress of caries in teeth already erupted. There is no evidence that deficiencies of vitamin A, either during the period of tooth formation or at a later period, contribute to caries susceptibility. No studies have been reported on the effect of inadequate amounts of the B vitamins during the time of tooth formation on caries in man or animals. Kniesner, Mann and Spies have reported that caries among patients hospitalized for treatment of vitamin B complex deficiencies was apparently not increased. Whether vitamin C deficiency promotes the resistance of human teeth to caries is still a question. There are no data to indicate augmentation of caries in children receiving diets partially deficient in calcium or phosphorus. 34 references, 2 tables, 11 figures.

(Paradoxical as it seems, the whole may be greater than the sum of its recognized parts. Whatever the reason, there is good clinical evidence that children who receive regularly diets of high nutritional worth are less disposed to develop tooth decay than are the members of the general child population. No conclusive evidence has been produced to identify any one foodstuff as specifically protective against tooth decay, yet through general betterment of diet habits there is promise of greater reduction of tooth decay than has been accomplished through diets based on specific food prohibitions, or on the effect of fluorides.

The respective Councils on Foods and Pharmacy of the American Medical Association have adopted decisions stating that vitamin D is effective in the prevention of dental caries during tooth formation and calcification. Administration of vitamin D has no effect after teeth are

erupted and fully calcified. Many dentists believe that overdose of vitamin D can do demonstrable harm to teeth.—ED.)

F. Miscellaneous Conditions of Teeth and Gums

Ranges of Normalcy in the Eruption of Permanent Teeth. *V. O. Hurme, D.M.D. Forsyth Dental Infirmary, Boston, Mass. J. Dent. Child. 16: 11-15, Second Quarter, 1949.*

An analysis was made of the data on record with respect to eruption of teeth in childhood. The statistical material comprised 93,000 children. The summary table is reproduced here. 1 table. 1 chart.

TABLE I

Eruption standards for the permanent teeth of white children living in northern temperate zone.

ORDER OF EMERGENCE	TOOTH		MEAN AGES OF EMERGENCE		STANDARD DEVIATION (both sexes)	SEX DIFFERENCE*
	MAX.	MAND.	BOYS	GIRLS		
1	—	M ₁	years 6.21	years 5.94	years 0.30	years 0.27
2	M ₁	—	6.40	6.22	0.30	0.18
3	—	I ₁	6.54	6.26	0.78	0.28
4	I ₁	—	7.47	7.20	0.81	0.27
5	—	I ₂	7.70	7.34	0.88	0.36
6	I ₂	—	8.67	8.20	0.98	0.47
7, boys 8, girls	Pm ₁	—	10.40	10.03	1.47	0.37
8, boys 7, girls	—	C	10.79	9.86	1.27	0.93
9	—	Pm ₁	10.82	10.18	1.47	0.64
10	Pm ₂	—	11.18	10.88	1.57	0.30
11	—	Pm ₂	11.47	10.89	1.68	0.58
12	C	—	11.69	10.98	1.37	0.71
13	—	M ₂	12.12	11.66	1.36	0.46
14	M ₂	—	12.68	12.27	1.37	0.41
Average sex difference* — girls earlier than boys						0.45 years (5.3 months)

*Difference between mean ages of emergence for boys and girls.
(M₁, first molar; I₁, first incisor; Pm₁, first premolar; etc.)

Gingivitis From the Standpoint of the Physician. *Frederick F. Tisdall, University of Toronto and Hospital for Sick Children, Toronto, Canada. J. Dent. Child. 15: 12-17, Third quarter, 1948.*

Mild but obvious gingivitis is frequently encountered in apparently healthy individuals. The frequency with which this condition is seen even in children and young adults makes it of concern to both the dental and medical professions. Both local and systemic factors are involved in the production of gingivitis. Evidence is presented that one of the systemic factors may be a low intake of ascorbic acid.

One hundred and fifty members of the Royal Canadian Air Force all under 30 years of age, men and women, with a mild or moderate degree of gingivitis were studied. They were first subjected to local treatment to remove as rapidly and completely as possible all evidence of inflammation of the gingival tissues. They were then divided into 4 groups. Group 1 received food containing approximately 10 mg. of ascorbic acid per day, group 2 received food containing 25 mg., group 3 received food containing 10 mg. plus 70 mg. of ascorbic acid in tablet form, and group 4 received food containing approximately 75 mg. of ascorbic acid per day. Great care was taken to ensure that the food served actually contained the desired amount of ascorbic acid. Clinical evaluation of redness, swelling, bleeding and tenderness was made at monthly intervals, as well as determination of the ascorbic acid blood levels.

When the study was completed at the end of eight months, it was found that in the individuals who had received food containing approximately 10 mg. of ascorbic acid per day gingivitis recurred much more frequently than in the individuals receiving approximately 75 mg. per day. The results with the group receiving approximately 25 mg. of ascorbic acid per day stood midway between the low intake and the recommended intake of 75 mg. per day. The results obtained with the group receiving the recommended intake, largely in synthetic form, were not as good as with the group receiving the same intake supplied in the food consumed. From this study it would appear that a diet low in ascorbic acid predisposes the individual to gingivitis.

(Interested readers are referred to the source article for this paper: Linghorne, Tisdall et al, Canad. M. A. J. 53: 106, Feb. 1946. Numerous studies on the treatment of gingivitis have failed to show any beneficial effects from ascorbic acid therapy unless frank scurvy was a factor. Scurvy is now a rare disease in this country and gingivitis is very common. In fact, almost no adults have entirely normal gums. Adults on special diets containing 0 to 25 mg. of ascorbic acid per day have shown little or no gum deterioration over periods of 6 to 22 months, even though in many of these subjects the plasma ascorbic acid level was zero for long periods and the white cell-platelet level had also been zero for a few weeks. (Crandon et al, New England J. Med. 223: 353, 1949; Pijoan & Lozner, Bull. Johns Hopkins Hosp. 75: 303, Nov. 1944; Najjar et al, Ibid. p.315). Some of the subjects' "pyorrhea" healed even though they had taken only 25 mg. of ascorbic acid

per day for 18 months (Najjar et al). The study abstracted above suggests that persons predisposed to gingivitis (all the subjects had been treated for gingivitis before the study began) are less likely to remain free of recurrences on an intake of 10 mg. of ascorbic acid per day than on 75 mg. The results with 25 mg. intakes fall between. Part of the discrepancy between this and other studies may lie in a finer discrimination between normal and abnormal gums. Further long-term studies in intakes between 25 and 75 mg. would be advisable.

The importance of the problem lies in its relation to the health of the periodontal tissues. More teeth are lost due to failure of their supporting structures than through decay of the tooth itself. Furthermore, restorative dentistry can save many decayed teeth but is useless if the tooth is to fall out anyway. Nutrition and general health are probable factors in maintenance of the periodontal tissues. Correction of malocclusion and oral hygiene are also of great importance. As in most health endeavors, the period of childhood is the proper time to initiate prophylactic measures.—ED.)

Thumb-Sucking. Maury Massler and Arthur W. S. Wood, University of Illinois, College of Dentistry, Child Research Clinic, Chicago, Ill. J. Dent. Child. 16: 1-9, First Quarter, 1949.

In the young infant with no teeth, thumb-sucking produces no ill effects. There is also no effect on the primary dentition in the average child. Thumb-sucking during infancy is therefore not of concern to the dentist and should be of no concern to the parent if no physical effect is produced on the teeth. With infants whose sucking is vigorous enough to displace the teeth, the act should be interpreted as a symptom of: 1) insufficient feeding; 2) inadequate love for the child, or 3) a bored, unhappy or overfatigued child. Parental counselling by the pediatrician may be adequate to relieve the conditions which have led to the thumb-sucking. There is also evidence to suggest that the length of eating time should be increased since prolonged sucking may result from the fact that rapid feeding satisfies the hunger reflexes before the lip and mouth reflexes have been satisfied (Kunst, 1948). In general, mechanical restraints are to be condemned. Their use may aggravate rather than relieve the emotional aspects responsible for the thumb-sucking. No attempt should be made to cure the habit in a malnourished or sick infant or child who may obtain significant emotional gratification from it. The only treatment necessary may be a little more cuddling and playing with the child and simple instruction to the mother on feeding the infant.

It is normal for the pre-school child to suck his thumb occasionally, especially when fatigued and on the verge of going to sleep. More persistent thumb-sucking may indicate regression to an infantile emotional pattern as a response to boredom or frustration. When thumb-sucking continues after the third year in a vigorous manner, it is a symptom of emotional immaturity or a strong regressive tendency, though occasional sucking should give no concern to the parent or doctor. Thumb-sucking, like cigarette smoking, can indicate content or discontent. An infant often sucks his thumb contentedly

after a full meal, prior to falling asleep or, on the other hand, he may suck his thumb vigorously and cry when he is hungry. The vigor of the act and the emotional state of the child while performing the act are all-important considerations that condition interpretation.

Corollary to the act of sucking are the accessory movements performed by the other hand. These are particularly noticeable in the pre-school child. The most common associated movement is holding or stroking a piece of cloth, blanket, pillow or ragged doll. Covering the eyes, pulling the ears and stroking hair or lip are frequently observed. If the thumb-sucking continues intensely during the second year of life while the primary teeth are erupting, the upper anterior teeth may be displaced labially. Such displacement is not serious, for as soon as the habit is stopped, the normal action of the labial musculature will move the displaced primary teeth back to their normal position. If spontaneous correlation does not occur after the thumb-sucking ceases, the labial musculature may be abnormal in size or function. If the cause can be discovered and the thumb-sucking ceases before the sixth year, the dental deformity will be remoulded and corrected in about 70% of cases. As a rule, when sucking ceases before the eruption of permanent teeth the deformity in the primary arch will spontaneously correct itself. If the child has a normal musculature its action on the teeth will correct the deformity produced by the sucking habit. If musculature is abnormal, malocclusion will result even in the absence of thumb-sucking. The abnormal musculature is the causative factor in such cases; thumb-sucking merely precipitates and aggravates the malocclusion. Thumb-sucking above the age of 5 or 6 is usually a manifestation of general emotional and social immaturity, and may lead to a serious deformity of dentition. The actual mechanical forces involved in thumb-sucking are: the passive force of the thumb against the arch; the abnormal contraction of the cheeks against the side of the arch by the sucking action; the abnormal muscular pressure of the thumb against the palate. When pressure is exerted on the upper incisors in an upward and outward direction, a protrusion of the maxillary incisors is produced. Pressure is also exerted in a backward direction and the mandible may become locked in distal occlusion. The abnormal pressure of the cheek muscles, particularly the buccinator, against the posterior arch causes a narrowing of the arch.

There are two schools of thought concerning the use of "corrective devices". One group, usually older dental practitioners, advocates a number of "cures" — bitter material (usually tincture of aloes) painted on the finger; mechanical thumb guards; ridicule by the parent or playmates; shaming by the dentist, or appeal to the sense of being "grown-up". The other group, usually psychologists and pediatricians, condemn such devices as punishments, and fear the potentially serious effects of such punishments upon the emotional and mental life of the child. Intelligent understanding of the reason for the act must precede any attempt to correct it. Certain orthodontic devices are nevertheless helpful provided the child understands why they are given and asks for their employment. Of this sort are mani-

cures, a gauze bandage or adhesive wrapped on the finger as if for a cut rather than the grotesque mitts offered by misguided manufacturers, and intra-oral appliances used to straighten the teeth rather than to spike the thumb. What often happens with such devices is that other habits such as nail-biting, or finger picking take the place of the thumb-sucking. Nevertheless, since malocclusion of the mixed or permanent dentitions (after the age of 7 years) caused by thumb-sucking is usually permanent and not self-corrective, orthodontic intervention for thumb-suckers above this age is usually recommended, even when the cause cannot be removed. 64 references.

1. Allergy

Cow's Milk Idiosyncrasy in Infants. *Stephan Vendell, Norrtull Hospital, Stockholm, Sweden. Acta Paediat. 35: 1-37, Fasc. 1, 1948.*

The identification of cow's milk idiosyncrasy as a clinical syndrome dates from the report of Schlossman and Moro in 1903. All degrees of sensitivity to cow's milk can be found. The symptoms range from mild postprandial distress, few loose bowel movements and constipation to profound vasomotor collapse following the ingestion to a small amount of milk. Cutaneous tests are not always reliable. These tests merely demonstrate the specific sensitivity of the skin and not any other shock organ.

The case histories of 23 patients are reviewed. The complaints were predominantly gastrointestinal. A few infants had an anaphylactoid episode following the ingestion of milk. One group of patients who had a short incubation period before developing symptoms following ingestion of milk had a constitutional predisposition to allergy and other atopic manifestations, such as asthma, eczema, urticaria, blood eosinophilia and cutaneous and circulating atopic antibodies. The prognosis in this group was generally poor. Another group had a latent period of several hours before symptoms appeared. A familial history, eczema, asthma, urticaria, blood eosinophilia or positive cutaneous tests were usually not evident in the members of this group. A third group seemed to fall midway between the 2 groups. 2 tables.

(The significance of this paper rests upon the awareness of the author to the varying degrees of clinical sensitivity to cow's milk. It is not always possible to classify these patients. The latency of symptom onset may be due to sensitization by the smaller milk protein molecules, such as polypeptides not formed until after partial digestion of milk protein. When there is evidence of cow's milk sensitivity, soya bean milks, casein hydrolysates, meat milks or goat's milk are given. At least one of these cow's milk substitutes will be found well tolerated.—ED.)

Favism. Report of a Case in a Child. *Harold I. Lecks, Children's Hospital of Buffalo and University of Buffalo, Buffalo, N. Y. J. Pediat. 34: 309-14, March 1949.*

Favism is an acute hemolytic disorder produced apparently by sensitivity of the patient to the protein of the fava bean. Approximately 8 cases have been reported in the American literature, three of whom have

been children. The fava bean is a legum which resembles the lima bean except that it is about twice as large. It is a staple food in Italy among families of the lower economic classes. In this country it is cultivated where there are large Italian communities. The manifestations of an attack are those of a hemolytic crisis, with acute jaundice and profound anemia. The degree of sensitivity to the bean determines the severity of the attack. Sensitivity may exist not only to the bean but to other parts of the flowering plant.

The patient was an Italian male child of 4 years who had eaten two raw fava beans and a small portion of the cooked beans approximately 72 hours before the onset of symptoms. Jaundice, anemia and hepatomegaly were evident upon examination. The hematologic studies demonstrated acute erythrocyte destruction. Convalescence was uneventful and the patient was discharged 10 days after onset of the episode. No treatment was given other than ferrous sulfate by mouth. The child's grandmother as a young woman had had marked sensitivity to the flowering fava plant. Studies undertaken to determine the toxicity of the fava bean extract and the antibody response of the patient over a five month period of observation failed to demonstrate definite sensitization as shown by skin tests, passive transfer experiments and precipitin reactions. The sudden onset of asymptomatic jaundice in an Italian child should suggest investigation of the possibility of recent fava bean ingestion. 1 table.

The Management of Atopic Eczema in Infancy and Childhood. *John Ross and Alan Brown, Hospital for Sick Children and University of Toronto, Toronto, Canada. Canad. M.A.J. 58: 486-90, May 1948.*

A consistent allergic regimen should be employed in the investigation and management of atopic eczema. Non-allergic seborrheic dermatitis and erythroderma desquamative (Leiner's disease) must always be excluded. Of 85 eczema patients tested intradermally, 65 gave positive reactions. The age range was from 4 months to 14 years. Egg, milk and wheat were the principal food excitants. Many patients also reacted to wool, dust, feathers and animal danders. When scratch and intradermal tests are not possible, the trial and error approach may be used to eliminate the responsible food or environmental allergen. Cutaneous tests may have no significance under 5 months of age and, when positive, may signify intrauterine sensitization.

The diet for the infants with eczema should include denatured cow's milk (evaporated milk boiled) or a milk substitute, a pure cereal, restriction of vegetables to one or two foods, and synthetic forms of vitamin D and C. Foods to which the infant shows clinical sensitivity or a positive cutaneous test are not given. New foods are introduced at weekly intervals if the eczema is not made worse. Such environmental allergens as wool, feathers, silk and fur are eliminated from contact with the patient's skin. In the older child eczema has a predominantly papular appearance and affects the flexural surfaces. Treatment is comparable to

that of the infant, with removal of the offending allergen, elimination diets, environmental control and topical treatment. Local treatment consists of clearing secondary infection by antiseptics and soaks. The authors use mercurial derivatives and penicillin. When the skin is dry and lichenified, coal tar products are applied. Environmental control may prevent further allergic complications later in life. 1 table.—*H. Lecks.*

(The local use of mercurials and penicillin should be cautioned against except for very specific indications. Sensitization to these agents frequently occurs.—ED.)

2. Anomalies, Genetics

Congenital Malformations. *Douglas P. Murphy, University of Pennsylvania, Philadelphia, Pa.* J.B. Lippincott, Phila, 1947. 127 pp. \$5.00.

A survey was made of all Philadelphia families in which malformed children had died during the five years between 1929 and 1933. Approximately 47 individuals possessing congenital malformations were born alive or dead per 10,000 live births. In families already possessing a malformed child, the birth rate of subsequent defective offspring was, in contrast, approximately 1,120 per 10,000 live births. Among deaths and stillbirths from all causes, approximately 68 per 10,000 exhibited gross congenital malformations. Malformations afflicted white persons and Negroes in the ratio of 57 to 32.

Among the families bearing malformed children, only 1.8% gave a history of consanguineous marriage between parents or other progenitors. Malformed children were born to older mothers more often than to young mothers, but a wide difference in ages between the parents was not observed. No correlation was found with the occupation of the father or the occurrence of maternal menstrual abnormalities, previous maternal pelvic disease, or rapidly repeated childbearing. Malformed offspring were born prematurely more than four times as often as their normally developed siblings. Later-born children were malformed more often than their earlier-born siblings. In families having more than one defective child, the second defective sibling was more likely to be born late than to result from the first conception to take place after the defective sibling. The malformed child was preceded by a period of relative sterility more often than its normally developed siblings.

Of the 935 malformed infants, 77.2% had defects involving only one portion of the body, whereas the rest had multiple defects. Defects involving primarily the nervous system were by far the most common (60.5%). Next in order were the gastrointestinal tract (15%), bones, muscles and skin (11%), cardiovascular (8.6%), monsters (3%), genitourinary (1.1%), and miscellaneous (0.8%). The most frequent neurologic malformation was hydrocephalus. The defect observed in the first malformed child in a family was duplicated in a subsequent sibling in 46%. In 39 cases, a distant relative of the malformed child exhibited a congenital

malformation which was identical with that of the malformed child in 46%. One mother in successive pregnancies had 2 children, each with absence of the right side of the diaphragm, which is the side less often affected. One father had a child with a harelip and cleft palate by each of 2 wives. These defects were right-sided, the less common side for this anomaly.

Seventy-five women who received radium or roentgen irradiation to the pelvic area during pregnancy had 38 abnormal offspring. In 28 of these the abnormalities could not be attributed to the maternal irradiation. Twenty had severe disturbances of the central nervous system, 16 being microcephalic. Two were otherwise mentally deficient, but without gross physical deformities; one was hydrocephalic, and one was a cretin with the features of a mongol. The other 8 children exhibited spina bifida and double clubfeet, ossification defects of cranial bones, deformities of upper extremities, hydrocephaly and deformities of arms, alopecia of the scalp, divergent squint and blindness at birth. Two of the 28 mothers subsequently gave birth to normal infants. A survey is given of recorded reports on maternal rubella during pregnancy as a cause of congenital malformations in the child.

"The observations assembled in the present volume seem to justify the following statements: (1) when a congenital malformation has a genetic basis, there is a greatly increased chance that subsequent brothers or sisters will also be malformed; (2) when a congenital defect is due to factors that are not genetic in origin, offspring conceived subsequently should be congenitally malformed only with the same frequency as is commonly observed in the population at large."

(This is an important contribution to the understanding of congenital malformations. It should be noted that the study is based on death certificates, i.e., in families in which at least 1 child died and had a congenital malformation during the five year period. It is a selected group to this extent, not a cross-section of the population. Non-lethal anomalies escape mention.—ED.)

Chondrodystrophy Fetalis. *Edith L. Potter and V. A. Coverstone, The University of Chicago and the Chicago Lying-In Hospital, Chicago, Ill. Am. J. Obst. & Gynec. 56: 790-93, Oct. 1948.*

A description is given of a father, mother and child, all chondrodystrophic dwarfs. The baby was delivered by cesarean section. This is a notable addition to the scanty records of an extremely rare type of mating. Chondrodystrophic children, for the most part, appear in families in which both father and mother are normal. The gene behaves as a simple dominant, but mutation and skipping of generations are frequent. 2 references. 1 figure.

(The most thorough genetic survey is that of Mørch (Chondrodystrophic dwarfs in Denmark Opera ex domo biologiae hereditariae

universitatis hafniensis, Ejnar Munksgaard, 1941). All dwarfs of this type in Denmark were ascertained as well as a number recently dead. Of 108 subjects 90 were sporadic, while 18, belonging to 8 sibships, had inherited the condition from a parent. No instance of longer transmission was found, though several are recorded in the literature. There was no single instance of the skipping of generations and Mørch, after a critical examination, concludes that nearly all the supposed instances are doubtful in regard to diagnosis or family history. The mutation rate is high; about 1/10,000 pregnancies results in an affected child as a direct consequence. Eighty per cent of affected babies die in the first year of life and the fertility of the survivors is low. Hence sporadic cases due to mutation are considerably commoner than those in which there has been transmission from a parent. There seems to be little risk in advising parents: (1) that a chondrodystrophic person has a 50% chance that any child will be affected; (2) that if an affected child is born to normal parents the risk in a subsequent pregnancy is little if at all greater than the 1/10,000 for any random pregnancy. Mørch corrects the often quoted conclusion of Rischbieth and Barrington that no affected woman can ever produce a living child by spontaneous delivery. This is extremely rare, but a few instances have been reported.—ED.)

Gargoylism (Lipochondrodystrophy). A Review of Clinical Observations in Sixteen Cases. William A. Reilly, University of Arkansas School of Medicine, Little Rock, Ark. and Stuart Lindsay, University of California Medical School, Berkeley, Calif. *Am J. Dis. Child.* 75: 595-607, April 1948.

Sixteen patients with gargoylism are described. There were several families in which more than one sibling had the disease. The early appearance and familial occurrence suggest an hereditary defect in the germ plasm as the cause of the disturbance. The earliest recognizable sign was kyphosis. Hepatosplenomegaly usually occurred before the first year of age. Cloudy corneas appeared later in infancy. Many of the characteristic manifestations appeared late. Pronounced skeletal deformities and the facies associated with skull changes often did not appear until several years of age. Hearing loss and mental deficiency appeared later in childhood. Other abnormalities noted were hirsutism, thickening of the skin and periarticular structures which resulted in limitation of joint motion, systolic heart murmur, and umbilical hernia. In 8 of these 16 patients death occurred before the age of 12 years. Only rarely have patients lived past adolescence. X-ray examination revealed disturbances in ossification, particularly in the vertebrae. Retardation in epiphyseal maturation and irregular cartilaginous proliferation were present in the long bones. A peculiar granulation in the polymorphonuclear leukocytes was noted in 50% of the patients. 70 references. 2 figures.

3. Blood, Hemopoietic System

Leucemia in Childhood: A Clinical and Roentgenographic Study of Seventy-Two Cases. *J. H. Dale, Jr., Cornell University Medical College, New York, N. Y.* *J. Pediat.* 34: 421-32, April 1949.

A summary is presented of the clinical, hematologic and radiographic findings in 72 cases of leukemia in infants and children. The incidence, age and sex distribution, signs and symptoms, and hematologic pictures are discussed. There is little variation from the figures of other similar studies. Special emphasis is given to the roentgenographic changes, and the value of long bone studies as an aid to diagnosis. Long bone films were taken in 40 patients in this series and osseous lesions were found in 72.5%. The most frequently encountered lesion was the transverse band of diminished density in the metaphyses of the long bones. All 29 patients with bone changes showed involvement of the knee area. It is suggested that roentgenograms of the knee can be utilized as a screening measure in suspected cases of childhood leukemia. 12 references. 5 figures. 5 tables.—*J. H. Githens, Jr.*

The Osmotic Resistance of Human Erythrocytes in Normal, Carrier and Anemic States. With Special Reference to Changes Due to Age, Race, Sick-cell Anemia, Mediterranean (Cooley's) Anemia and Congenital Hemolytic Icterus. *Benjamin Dickstein, W. E. Landmesser, Jr., Warner E. Love, T. Hastings Wilson and Irving J. Wolman, The Children's Hospital of Philadelphia and the University of Pennsylvania School of Medicine, Philadelphia, Pa.* *Am. J. M. Sc.* 217: 53-61, Jan. 1949.

The usual fragility test, which employs hypotonic salt solutions, is not always satisfactory in detecting abnormalities of the osmotic resistance of erythrocytes in various congenital blood disturbances. A temperature change of 0.5° C. or a pH change of 0.05 units has a measurable effect on the osmotic resistance, as do oxygenation, relative proportions of cells and solutions, manner of mixing, and duration of exposure. Utilizing Jacobs' method of inhibition hemolysis with four different hemolyzing solutions—a method which largely eliminates these various sources of error—170 normal persons and 90 anemic individuals have been studied. In white subjects the osmotic resistance of the erythrocytes in the 0 to 10 year age group proved to be greater than in normal adults. Hence, adult controls should not be used in fragility studies in infancy and childhood. A comparable age difference was not found in a limited number of Negroes examined. The average osmotic resistance of the erythrocytes of the normal Negro was greater than that of the normal white in the corresponding age group. The erythrocytes of children with sickle cell anemia were more resistant than in normal Negro children. The average for individuals with the sickle cell trait fell between that for sickle cell anemia and that for the normal, with considerable overlapping in both directions.

In both Mediterranean anemia and in its carrier state the blood was markedly more resistant than that of the normal controls, the carrier

showing a resistance as great as that of the anemic individual. In congenital hemolytic icterus the osmotic fragility was increased, as would be expected. In two suspected cases the method succeeded in demonstrating fragile cells which were not detected by the usual fragility test. 28 references. 6 figures.

(In the fragility test as ordinarily done, there is no attempt at buffering or control of temperature. The results so obtained are inconstant and often not reproducible. This accounts for the many contradictory statements in medical literature as to the fragility of the red cells in various disease states.—ED.)

Vascular Occlusion and Ischemic Infarction in Sick Cell Disease. Paul Kimmelstiel, Charlotte, N. C. Am. J. M. Sc. 216: 11-19, July 1948.

A case of sickle cell disease is presented in which cholecystectomy during sickle cell crisis resulted in death of the patient. Multiple large foci of recent ischemic necrosis were observed in inner organs, particularly in the brain, liver, and kidneys, without demonstrable occlusion of the vascular tree. A review of the literature revealed that the reports of vascular changes, particularly thromboses, were inconsistent in sickle cell disease and that there was lack of correlation between parenchymatous necrosis and mechanical vascular occlusion. A theory is presented which assumes that vascular spasm occurs during sickle cell crisis and which attempts to attribute the multitude of findings to a single process. The theory accounts for frequent reports of ischemic infarctions without vascular thrombosis as well as for the occurrence of thrombi, and eliminates the assumption of primary mechanical capillary blockage which cannot be correlated with gross infarctions. 23 references. 5 figures.—*Author's abstract.*

(At autopsy of children who have succumbed during a sickle cell crisis it is not uncommon to find many arterioles and capillaries distended and filled with interlocking masses of sickled red cells. It does not necessarily follow, however, as this author points out, that during life the masses of red cells were the cause of obstruction to circulation and subsequent infarction. Furthermore, the new theory here presented, if largely true; opens up another approach for attempts at therapy. The new drugs which cause peripheral vasodilatation such as Etamon and Priscol, should be given a trial.—ED.)

Incidence of Sicklemia in the Newborn Negro Infant. Roland B. Scott, Robert P. Crawford and Melvin Jenkins, Division of Pediatrics, Howard University School of Medicine and the Pediatric Service, Freedmen's Hospital, Washington, D. C. Am. J. Dis. Child. 75: 842-49, June 1948.

Of 262 newborn Negro infants tested for the sickling trait on the first, third, and fifth days of life, the reactions of 9, or 3.4%, were positive. No cases of active sickle cell anemia were detected. Of 209 older children tested for the sickling trait the reactions of 16, or 7.6%, were positive. Eight mothers of infants with the sickling trait were tested, and 2 of them were discovered to harbor the sickling phenomenon. 7 references. 1 figure. 10 tables.

Hereditary Pseudohemophilia, Report of 4 Cases. *James S. Hewlett and Russell L. Haden, Cleveland Clinic, Cleveland, Ohio.* *Cleveland Clin. Quart.* 15: 118-24, July 1948.

A brief review of the literature is presented with a report of 4 typical cases of hereditary pseudohemophilia. The disease is characterized by excessive bleeding and there is usually a positive family history. Frequently the bleeding tends to become less severe in later life, with periods of apparent remission. Laboratory studies show a prolonged bleeding time, normal platelet count, normal coagulation time, normal prothrombin time, and normal clot retraction. The tourniquet test is variable, being positive in about half of the cases. MacFarlane and Perkins have demonstrated that the excessive bleeding is due to a functional defect in the capillaries themselves, with inability of the vessels to constrict normally when subjected to trauma. There is no successful method of treatment. The disease appears to be inherited as a dominant Mendelian character with no evidence of sex linkage. It is differentiated from the other hemorrhagic diseases by a prolonged bleeding time in the presence of an entirely normal clotting mechanism. 13 references.—*J. H. Githens, Jr.*

Detection of Mild Types of Mediterranean (Cooley's) Anemia. *Carl H. Smith, New York Hospital and Cornell University Medical College, New York, N. Y.* *Am. J. Dis. Child.* 75: 505-27, April 1948.

Prompted by the increasing frequency with which the mild form of Mediterranean anemia is encountered at the Children's Clinic of the New York Hospital, the characteristic changes in the blood in 47 families with this disease were studied. Since the severe form of the disease requires homozygosity for the inherited factor, the recognition of healthy persons who are carriers and constitute a potential reservoir for transmission of the disease is important. The 16th census of the United States listed more than five million persons of pure or mixed Italian, Greek and Syrian descent.

The patients are usually of Mediterranean origin, primarily Greek and Italian. They are asymptomatic, mildly anemic or without anemia. Blood smear and blood count show hypochromic macrocytes, basophilic stippling, oval and target cells, and polycythemia. Morphologic changes in erythrocytes are far in excess of the degree of anemia. Resistance of the red cells to hemolysis in hypotonic solution of sodium chloride is increased. Iron and other forms of antianemic therapy fail to restore normal blood levels. The trait may be detected in parents and in siblings. The conspicuous roentgenographic changes and pronounced clinical manifestations which characterize the severe form of Mediterranean anemia are absent with the mild form. Diagnosis of the mild type depends on the evaluation of data derived from a variety of sources.

Determination of the hemoglobin content, the red cell count, the measurement of the volume of packed red cells with the hematocrit, the fragility test, and the examination of the blood smear constitute the essential laboratory procedures. Measurement of the volume of the red cells with

the hematocrit is deemed the most accurate single laboratory procedure for diagnosis and therapy. Because of the thinness of the erythrocytes and other alterations in size, the total count may approach normal levels despite a considerable reduction in the hematocrit value. To detect increased resistance of the red cells a screening test, utilizing blood from the finger in three concentrations of hypotonic saline solutions (0.375, 0.35, 0.325), is described. Target cells, oval cells, hypochromic macrocytes and stippled red cells are seen. All forms of antianemic therapy with the exception of transfusion fail to elevate the hemoglobin or hematocrit values or otherwise alter the blood picture. Children with severe and mild forms were found in 16 families; in 19 other families the milder types occurred exclusively. In every family with a severely anemic child both parents had the trait for the disease. 27 references. 8 figures. 2 tables.

(The fragility test is also a most important procedure for preliminary detection of both the mild and severe forms of the disease, provided pH, temperature and concentration are rigidly controlled. It would be a public health advance if all persons of Mediterranean origin had peripheral blood smear examinations and fragility tests to detect the carrier state. Only thus can the large reservoir of carriers who transmit and perpetuate the disease be kept under observation.—ED.)

4. Cardiovascular System

Thrombosis of the Superior Longitudinal Sinus in a Baby, Treated with Heparin and an Intravenous Drip. *S. van Creveld, J. I. de Bruyne and M. G. Stronk, University of Amsterdam, Amsterdam, Holland. Nederl. Tydschr. v. Geneesk. 93: 1144-45, April 9, 1949.*

A baby 3 months old with a congenital heart disease and cyanosis was diagnosed as having thrombosis of the superior longitudinal sinus. The condition disappeared completely after intravenous administration of fluid and heparin. Two months later the baby died from bronchopneumonia after a short illness and without having shown neurologic symptoms. At autopsy a transposition of the large vessels was found, with a small defect in the interatrial septum. A canalized thrombus was found in the superior longitudinal sinus. A focus of softening was present in the cortical and subcortical area of the left side of the brain. 3 references. 1 table.—*Author's abstract.*

Diagnosis of Pulmonary Stenosis by Angiocardiography. *Merl J. Carson, Thomas H. Burford, Wendell G. Scott, and James Goodfriend, Washington University School of Medicine and the St. Louis Children's Hospital, St. Louis, Mo. J. Pediat. 33: 525-43, Nov. 1948.*

Contrast visualization of the cardiac chambers and great vessels in series (angiocardiography) gives direct information as to the course of intracardiac blood flow and relative size and location of the cardiac chambers and great vessels. The method is applicable to patients of all ages; diagnostic radiograms are obtained as easily in small infants as in children and adults.

The authors describe the procedure and results obtained, utilizing a new automatized radiographic technic known as the tautograph. The tautograph makes 10 radiographic exposures within a period of ten seconds. This makes it feasible to follow the course through the heart of the diodrast injected into an antecubital vein. The dosage for infants 3 months to 2 years of age is 10 to 18 cc.; for children 2 to 10 years, 20 to 30 cc., and for children 11 to 15 years, 30 to 40 cc. The injection must be made as rapidly as possible. Infants and children too small to cooperate are given a general ether anesthetic. A sequence of exposures showing the normal configuration of the heart chambers and great vessels is first given. Angiocardiography can be safely utilized as a diagnostic aid in many cardiac conditions. It is of especial value with infants and small children in whom cardiac catheterization is impossible or impractical. The characteristic findings of tetralogy of Fallot, nonfunctioning right ventricle with tricuspid stenosis, persistent truncus arteriosus with stenotic pulmonary arteries and Eisenmenger complex are described and illustrated. 19 references. 25 figures.

Analysis of Malformations of the Heart Amenable to a Blalock-Taussig Operation. *Helen B. Taussig, Johns Hopkins Hospital, Baltimore, Md.* Am. Heart J. 36: 321-333, Sept. 1948.

Experience has shown that the tetralogy of Fallot is amenable to the Blalock-Taussig operation. This paper analyzes other varieties of cardiac malformations amenable to the procedure.

From July 1945 to July 1947, forty-seven patients with malformations other than the tetralogy of Fallot were operated upon for alleviation of symptoms due to pulmonary stenosis or atresia. Of these, 19 showed left axis deviation and were diagnosed as tricuspid atresia. Three of the 19 died, a mortality rate of 15%. Twelve had dextrocardia, representing a variety of additional anomalies, of whom 4 died (33%). Six cases with abnormality of rhythm are included since experience has shown that such irregularity is rare in the tetralogy of Fallot. The mortality rate in this group shows that the operative risk is far greater in persons having atypical malformations with pulmonary stenosis than in those with the tetralogy of Fallot.

Six criteria are needed for successful operation for these unusual anomalies. There must be: 1) reduced pulmonary blood flow; 2) a pulmonary artery to which to anastomose the systemic artery; 3) a systemic artery available; 4) a higher systemic than pulmonary pressure; 5) sufficient pulmonary function to permit the patient's survival during collapse of one lung and occlusion of one pulmonary artery; 6) such structure of the heart as to permit adjustment to the altered circulation. Lack of adequate circulation may be suspected by several clinical features but fluoroscopic confirmation is necessary. The existence of a pulmonary artery may not be definitely ascertainable prior to thoracotomy but various clues may be present. The presence of an associated patent ductus implies the presence of a pulmonary artery. Special laboratory studies are of aid

in doubtful cases. The exercise test developed by Bing is the simplest and best. On exercise, patients with reduced pulmonary blood flow show a fall in oxygen consumption per liter of ventilation in contrast to the normal rise and increased pulmonary flow. Angiocardiography and cardiac catheterization may also be helpful. There are 4 primary considerations with regard to the structure of the heart when considering operation: 1) some venous blood must reach the systemic circulation; 2) oxygenated blood must reach the aorta; 3) continuous circulation of blood at an accelerated rate must take place; 4) cardiac reserve must be sufficient to cope with the altered circulation. Less than 5% of the patients in this series of cases had progressive cardiac enlargement after operation or died of cardiac failure. Of the remainder, one-third had no increase in heart size; one-third had an increase in the first three post-operative weeks only, and one-third had an increase to the sixth month with no further enlargement. The end results as estimated by the red blood cell count, hemoglobin, and arterial oxygen saturation have shown as much benefit from subclavian anastomosis as with the larger innominate artery, and in addition there is less increase in heart size. In the first 350 operations, the overall mortality, regardless of the variety of anomaly, was 19%; in the next 250 it was less than 10%. For tetralogy of Fallot in the age group from 2 to 12 years, using the subclavian as the systemic artery, the mortality rate has been 7%. 4 tables.—R. N. Paul.

Myocarditis of Undetermined Etiology (Fiedler's Isolated). *Julius Y. Miller and James Marvin Baty, Boston Floating Hospital, Boston, Mass. Bull. New England M. Center. 10: 276-84, Dec. 1948.*

A case of myocarditis of unknown etiology with necropsy in a 13 year old boy is reported. This is the first time that the possibility of a familial tendency has been reported. Death was due to heart failure of six months' duration. At autopsy the heart weighed 310 Gm. and was symmetrically enlarged. The valves were all competent and showed no pathologic change. Considerable fibrosis of the myocardium was present in the form of scattered indefinite foci, for the most part small. There was also moderate hypertrophy of the unaffected muscle fibers, with edema. Slight perivascular cupping of lymphocytes was present in one or two places and there were occasional focal accumulations of lymphocytes. Of special interest was the history of 2 brothers who died at 12 and 23 years of age respectively, of illnesses very similar to, if not the same as, the patient's. 22 references.

5. Chemotherapy, Drugs, Poisons, Physical Agents

Staphylococci in the Newborn, Their Coagulase Production and Resistance to Penicillin and Streptomycin. *G. Martyn, University of Manchester, England. Brit. M. J. 1: 710-712, April 23, 1949.*

From 130 healthy, full-term, breast-fed infants in a newborn nursery, staphylococci were cultured from the nasopharynx in 127 (coagulase-positive in 81) infants and the stools in 130 (coagulase-positive in 65)

infants. Among the coagulase-positive strains, about 57% were resistant to 40 units of penicillin per ml. and about 2% to 1,000 units of streptomycin per ml., but not to both simultaneously. 7 references. 2 tables.

Poisoning Due to Ingestion of Wax Crayons. *H. Brieger, Division of Industrial Hygiene, Jefferson Medical College of Philadelphia, Philadelphia, Pa.* Read before the American Public Health Association, Nov. 10, 1948.

Poisoning due to the ingestion of wax crayons has been reported repeatedly since we first directed attention to this type of poisoning (*J. Pediat.* 30: 422, 1947). The picture of these cases was uniformly that of severe methemoglobinemia. Four different brands of wax crayons, red-orange, orange, yellow and violet in color, were involved. We have identified Para Red in the red-orange and orange crayons; the yellow crayons contain benzidine yellow YB. Samples of chlorinated Para Red submitted by crayon manufacturers, and of Para Red provided by E. I. duPont de Nemours and Company, Inc., were found to be practically insoluble in water or in standard solvents, with the exception of benzol. Neither pigment was dissolved in stomach fluid of pH 1.1 to 8.15. Feeding of wax crayons and Para Red or intravenous injection of concentrated suspensions of Para Red did not produce methemoglobinemia in dogs and rabbits. However, Dr. Samuel S. Spicer, Laboratory of Physical Biology, U. S. Public Health Service, with whom we have co-operated in this matter, observed methemoglobinemia and Heinz bodies in one-third of fasted cats fed red and red-orange crayons; 4 of 6 cats which had received Para Red in the diet showed the same phenomena. Dr. H. Russell Irwin of the Children's Hospital, Los Angeles, fed yellow crayons to cats, and found methemoglobinemia within five hours; these crayons contain benzidine yellow, as mentioned above. Until recently, these dyes had been considered to be practically insoluble and harmless. Their selective effect and the mechanism of this type of poisoning are still unexplained.—*Author's abstract.*

(Cats are the best laboratory animals for the study of methemoglobinemia-producing drugs. A higher percentage of cats fed crayons containing Para Red or benzidine yellow develops high blood levels of methemoglobinemia than do children. Whether the few children who exhibit methemoglobinemia after chewing crayons possess an idiosyncrasy to the dye, or whether there is some other toxic contaminant within the dye, remains to be demonstrated. The problem may not be solved unless adequate studies are done on human subjects.—ED.)

Granulocytopenia and Death Following the Use of Trimethadione. *Elizabeth Gentry and Lee Forrest Hill, Raymond Blank Memorial Hospital for Children, Des Moines, Iowa.* *Am. J. Dis. Child.* 75: 582-86, April 1948.

The third reported case of fatal granulocytopenia following the use of trimethadione ("tridione") is described. A 6½ year old boy had been given phenobarbital, bromides and dilantin since the age of 4 because of repeated grand and petit mal attacks. Six weeks prior to death, tridione was started.

Three weeks later the patient developed a sore throat and high fever. Blood count showed 2,700 white blood cells with 98% lymphocytes and 9.6 Gm. of hemoglobin. Sedation, a blood transfusion, crude liver extract, and vitamins failed to improve his white cell series. Premortem and postmortem bone marrow examinations were confirmatory. A plea is made for weekly blood counts on patients receiving tridione. 7 references.—*S. F. Coffin, Jr.*

Accidental Poisoning with Naphazoline ("Privine") Hydrochloride. *Winston C. Hainsworth, Department of Pediatrics, Columbia University College of Physicians and Surgeons, New York, N. Y.* *Am. J. Dis. Child.* 75: 76-80, Jan. 1949.

A 22 month old white boy is described who swallowed an estimated 3 or 4 cc. of a 0.1% solution of naphazoline hydrochloride ("privine hydrochloride"). The principal systemic manifestations of the poisoning were high blood pressure, bradycardia following initial tachycardia, bradypnea, lethargy, cold, clammy skin and low temperature. The symptoms lasted about 15 hours with recovery beginning at approximately 9 hours. 7 references. 1 chart.

6. Clinical Pathology

Frequency of Penicillin-Resistant Staphylococci. *A. Voureka and W. H. Hughes, Wright-Fleming Institute of Microbiology, St. Mary's Hospital, London, England.* *Brit. M. J.* 1: 395, Mar. 5, 1949.

To determine how frequently penicillin-resistant staphylococci could be isolated from the noses of apparently healthy persons, 315 strains isolated from 214 out-patients were tested. Twenty-four or 7.6% of the strains were resistant (insensitive to 1 unit/ml. or less), two-thirds of which were coagulose positive and, therefore, presumably capable of pathogenicity. 2 tables. 1 reference.—*C. Whitlock, Jr.*

The Cerebrospinal Fluid in Poliomyelitis. (*Il liquor nella paralisi infantile*). *Domenico Cirillo, University of Padua, Italy.* *Pediat. med. prat.* 23: 155-65, Aug. 1948.

Over a period of 17 years, the cerebrospinal fluid was examined one to 3 times in 442 patients with poliomyelitis. These studies ranged from the preparalytic stage of the disease to 30 or more days after onset. The spinal fluid protein was high (median 68 mg. %) during the preparalytic and early paralytic stages, falling to somewhat lower levels (median 48) between the first and second weeks of the illness. At the end of the second week or slightly later a renewed and more marked rise (median 88) occurred and persisted for 1 to 2 months. There was an early pleocytosis as high as 857 cells per cmm., falling to normal on the tenth day. During the first day or two polymorphonuclear cells predominated, rapidly giving way to lymphocytes. Thus

after the tenth day there regularly occurred a prolonged period of albuminocytologic dissociation. In 75% of 75 cases a rise in spinal fluid sugar (above 60 mg. %) was observed. No case showed a decrease. No correlation could be drawn between the intensity of these changes and the clinical course of the disease. 41 references. 4 tables.—*A. M. Bongiovanni.*

(In other words, when a child is being studied as a poliomyelitis suspect more than two weeks after the onset of paralysis, the finding of increased protein in the cerebrospinal fluid is suggestive evidence, but an increased cell count should not be expected.—ED.)

7. Endocrine System

The Effects of the Adrenal Cortical Hormone 17-hydroxy-11-dehydrocorticosterone (Compound E) on the Acute Phase of Rheumatic Fever: Preliminary Report. *Philip S. Hench, Charles H. Slocumb, Arlie R. Barnes, Harry L. Smith, Howard F. Polley and Edward C. Kendall, Mayo Foundation, Rochester, Minn. Proc. Staff Meet. Mayo Clin. 24: 277-97, May 1949.*

The adrenal cortical hormone 17-hydroxy-11-dehydrocorticosterone (cortisone or Compound E) was given to 3 patients with acute rheumatic fever. There ensued rapid disappearance of the fever of tachycardia and polyarthritides of the elevated sedimentation rates and of the abnormal electrocardiographic changes. The patients were between 15 and 17 years of age. It is emphasized that these patients will have to be observed for many months before it can be determined whether or not compound E has prevented or lessened the development of chronic organic injury to the heart valves or myocardium. 33 references. 5 figures. 4 tables.

Kidney Disease in Juvenile Diabetes Mellitus (*Die Nephropathie Beim Kindlichen Diabetes Mellitus*). *G. Fanconi, A. Botsztein and C. Kousmine, Lausanne, Switzerland. Helvetica Paediatrica Acta 3: 341-79, Nov. 1948.*

The Kinderspital in Zurich has had a large proportion of fatal renal disease among juvenile diabetic patients. Since the introduction of insulin in 1925, 136 diabetics have been seen of whom 87 could be followed. Thirteen cases died in diabetic coma or from other causes (tuberculosis) and 9 from renal disease. Few patients over 20 years of age are free from kidney disease, none in those with diabetes of over 15 years' duration. One patient under 20 years old has had diabetes for 15 years without kidney disease. No patient with diabetes lasting 21 years is alive and only 4 are alive in whom diabetes has been present 15 years.

The onset of diabetic renal disease is insidious but the average time when permanent signs appear is 10 years after the start of the diabetes (range 4 to 16 years). It seems to start earlier in those cases given a low

protein, fruit and vegetable diet before the fifth year of diabetes. At the onset of renal disease, the youngest case was 15 years old, the oldest 28 years, with the average age 19½ years. Even when diabetes begins in infancy, the kidney seems not to be involved before puberty. The onset of puberty seems to favor the appearance of renal damage; nephrosis occurs at this time whereas, later, nephrosclerosis is predominant. Years prior to the onset of frank renal disease, transitory hypoproteinemia, hypercholesterolemia, proteinuria or edema may occur singly or in combination. The serum protein level is labile in diabetes, being high with coma and low early during recovery, probably due to liver damage. A low value in the absence of acidosis is an early sign of nephrosis. The blood cholesterol level is also unstable, being high in those with poor diabetic control. It may be low in severe coma. Transient proteinuria may occur with overexertion, intercurrent infections or coma. Hydrolability is common and latent and frank edema occurs even before the onset of proteinuria. Sodium bicarbonate tends to produce edema and therefore is not recommended for treatment. Similarly, the blood chloride level is variable. Diabetic acidosis is common and probably predisposes to kidney disease..

After the pre-nephrotic phase, permanent signs of pure nephrosis may occur without elevated blood pressure or azotemia. Diabetic nephrosis differs from lipoid nephrosis in that the edema is not as marked; it may occur before proteinuria and responds more readily to treatment. Proteinuria is often the first sign and is minimal at first. Doubly refractive bodies and microscopic blood appear in the urinary sediment. The serum chemistry is not markedly changed, nor is the hypoproteinemia severe. The erythrocyte sedimentation rate is moderately fast. Persistent diarrhea or pyuria often precede the onset of nephrosis.

Nephrosclerosis occurs in older diabetics and follows diabetic nephrosis by 2 to 3 years. Hypertension is invariably present and may be accompanied by severe headaches. Azotemia is an inconstant but poor prognostic finding. Isothenuria is characteristic but may not be present even late. Paradoxically, following the beginning of renal disease, the diabetes improves so that coma no longer occurs and the insulin requirement may drop about one-third. Patients die from their kidney lesions rather than from diabetes. In the 7 cases that died from nephrosclerosis, the renal disease lasted 5 years; in the 2 that died with nephrosis and tuberculosis it lasted less than 1 year. Diabetic cataracts and retinitis occurred in 13 of 18 cases of diabetic renal disease, caused by the diabetes rather than by renal disease.

The low protein diet, while very successful in the immediate control of diabetes, seems to predispose to renal disease in later years. The diet should be adequate in protein but low in fat which may produce arteriosclerosis. Because base is lost during acidosis and polyuria, sodium should be added unless nephrosclerosis is present. Recently, an unrestricted diet avoiding excess fats and sweets has shown promise. 22 references. 14 tables.—*L. V. dos Remedios.*

(Recently completed long-term studies show that to avoid the complications of diabetes, good control is especially important in children. This means the avoidance of hyperglycemia, glycosuria and hypoglycemic shocks and usually can be achieved initially only by weighing each meal, the use of 4 doses of regular insulin or 2 of regular and 1 of globin insulin, 4 daily urinalyses and a fairly constant amount of activity. The child and his parent should be carefully indoctrinated in the necessity for perfect control and a daily record must be kept which is checked periodically. They should try to learn as much about diabetes as possible. Eventually, this regimen may be made a little less rigid.—ED.)

Experimental Study of Life Situations, Emotions, and the Occurrence of Acidosis in a Juvenile Diabetic. *Lawrence E. Hinkle, Jr. and Stewart Wolf, New York Hospital and Cornell University Medical College, New York, N. Y.* Am. J. Med. Sc. 217: 130-35, Feb. 1949.

In an anxious, maladjusted, and severely diabetic 15 year old girl, stressful life situations which aroused the emotions of fear and rage were accompanied by alterations in the metabolism, including ketonuria within approximately 12 hours of the onset of the stressful situation. When the stress continued the ketosis progressed to the point of clinical acidosis. Without change in diet or additional insulin the acidosis disappeared when the subject regained confidence and security. 12 references. 5 figures.

8. Eye, Ear, Nose And Throat

Retrolental Fibroplasia in Premature Infants. *William C. Owens and Ella U. Owens, Johns Hopkins University and Hospital, Baltimore, Md.* Tr. Am. Acad. Ophth. 18-41, Sept.-Oct., 1948.

Followup examinations were made of 120 premature infants born between 1935 and 1944, whose birth weight had been 2000 Gm. (4½ lb.) or less. No cases of retrolental fibroplasia were found. Of 214 premature infants born between 1945 and 1947 whose birth weight was 2000 Gm. (4½ lb.) or less, none had retrolental fibroplasia at birth. In 111 of these children followed for six months or more, five instances of retrolental fibroplasia developed. The incidence was 1.3% in the group weighing from 1360 to 2000 Gm. (3 to 4½ lb.) at birth, and 12.1% among those weighing less than 1360 Gm. (3 lb.) at birth. The condition was not seen in full term infants. The development of retrolental fibroplasia was followed in 9 of these infants. None had microphthalmia at birth. The onset was between 2 and 5 month of age when all visible remains of the hyaloid system had disappeared. In early observations the external appearance of the eyes and fundus was normal. The earliest detectable abnormality was a slight dilatation of the retinal arteries and veins. The dilatation of both the arteries and veins gradually increased. The veins increased to about three times normal size. The vessels also became very tortuous, especially the arteries. This was

soon followed by one or more small grayish yellow elevations of the retina in the far periphery. The margins of the disk soon became blurred and generalized retinal edema developed. The grayish masses of elevated retina in the periphery increased in height, and similar areas appeared scattered throughout the fundus. After a short time, a large mass of swollen retina with numerous vessels coursing over it billowed forward in folds at the periphery of the retrolental space. Bands of tissue extended from the areas of detached retina into the vitreous. Finally a complete retrolental membrane was formed by gradual extension and fusion of the peripheral folds. Occasional small hemorrhages occurred into the membrane from the vessels on its surface. The diameter of the cornea was usually smaller than normal. The anterior chamber became shallow. Posterior synechias formed and the iris developed a grayish atrophic appearance. Secondary changes sometimes occurred. These consisted of further shallowing of the anterior chamber with extension forward of the iris and lens in a domelike fashion. The tension rose, the cornea became cloudy and the eyes enlarged. In some cases this phase was transient. Occasionally the course of the disease became arrested at some stage in its progress, producing an incomplete picture. Dilatations of the retinal vessels and formation of grayish elevations were observed as early as 80 days after birth. An incomplete retrolental membrane appeared as early as 85 days. A complete membrane developed in 1 case at 105 days. In none did a retrolental membrane develop after five and one-half months of postnatal life.

These observations indicate that retrolental fibroplasia in premature infants is not due to an arrest in growth or aberration of some embryonic or fetal structure. It is not fibrous tissue associated with a persistent hyaloid artery. Its early stages are characterized by angiomatous dilatations of the retinal vessels followed by extensive retinal detachment. No clues as to cause were found in this study. The question is raised whether the measures employed in premature nurseries to compensate for the physiologic immaturity of these infants may play a role. Note is made of diets high in protein, large amounts of vitamins, repeated transfusions of blood and plasma, parenteral amino acids, hormone therapy, and prophylactic penicillin. It is possible that retrolental fibroplasia may be related etiologically to angiomatosis retinae or to Coat's disease. 9 references. 2 tables. 5 figures. 1 graph.

(Retrolental fibroplasia seems to be on the increase, and the authors are therefore justified in questioning whether some of the more recent developments in the care of premature infants may not bear an etiologic relationship. On the other hand, the increase may be more apparent than real, due to higher survival rates for the smaller premature infants. Many problems with respect to the pathogenesis of retrolental fibroplasia in premature infants are still not clear. For one thing, the terminology leaves much to be desired. The condition includes not only a detachment and fibrous proliferation of

the retina, but often a number of other associated defects in the iris, fundus and eyeball as a whole. Mental retardation or even feeble-mindedness may be a concomitant. Other authors have reported instances of what appeared to be a typical retrolental fibroplasia of the premature, but differing from the cases here described in that the changes were already obvious at birth or seemed causally associated with congenital anomalies in other parts of the body. There may be two (or more) superficially similar but basically different diseases of the retinal region in the premature infant. Owens and Owens, whose work is here summarized, are strongly of the opinion that the disease has an acute onset, runs an active course, and then subsides. "The final picture varies depending upon the severity of the acute phase, and the extent of contracture of the fibrous tissue formed."—ED).

9. Gastro-Intestinal System

Islets of Langerhans In Fibrocystic Disease of the Pancreas. A Hitherto Undescribed Abnormality? *Olav Torgersen, Rikshospital, Oslo, Sweden. Acta Pathol. 25: Fasc. 1, 1948.*

In each of 5 cases of fibrocystic disease of the pancreas the islets of Langerhans were present in fairly normal numbers, and superficially appeared normal or slightly edematous on close study. However, many of the islets contained one or more duct-like lumens, lined by an epithelium of somewhat varying structure. In several instances serial histologic sections revealed a "hilus" in which the ducts seemed to leave the islet to join the nearest small excretory duct. These duct formations are interpreted as being remnants of the endodermal embryonic structures. "The peculiar thing is that, in fibrocystic disease at least, these tubules seem to persist in postfetal life, within otherwise fully developed islets of Langerhans. Further, the tubules may appear as well-differentiated structures, and, finally, their epithelium may become the seat of retrogressive changes." 16 references. 6 figures.

The Relationship of Fibrocystic Disease of the Pancreas to a Deficiency of Secretin. *Archie H. Baggenstoss, Marschelle H. Power, and John H. Grindlay, Rochester, Minnesota. Pediatrics 2: 435-42, Oct. 1948.*

The authors have noticed a histologic similarity between the pathologic changes in the pancreas among many adults dying of uremia, carcinoma of the stomach, obstruction of the small intestine, chronic ulcerative colitis and sepsis, and the lesion observed in the early stages of fibrocystic disease of the pancreas in children. Somewhat similar lesions in the pancreas — dilatation of the acini, flattening of the lining epithelial cells and inspissation of secretion — have been produced experimentally. From this evidence the authors have hypothesized that the following mechanisms are at work in the pathogenesis of the lesion in adults: 1) inhibition of the type of pancreatic secretion normally stimulated by secretin; 2) nervous stimulation of the pancreas leading to depletion of zymogen granules and formation of a thick, viscid juice; 3) dehydration which results in inspissation of the juice and the

development of intrinsic obstruction; 4) malnutrition (deficiency of protein) resulting in failure of reparative protein synthesis in the cells of the pancreatic acini. They hypothesize further that a congenital deficiency of secretin may be responsible for fibrocystic disease of the pancreas in children. This is predicated on the assumption that fibrocystic disease of the pancreas is the result of an abnormally thick and inspissated acinar secretion. Nervous or pancreozymin stimulation of the pancreas produce a thick viscid juice; secretin causes a flow of alkaline fluid which flushes the alveoli, thins the juice rich in organic material and sweeps it along the ducts. In the absence of this diluting and flushing effect, the thick viscid juice produced by nervous and pancreozymin stimulation might readily undergo stasis and inspissation, obstruct the ductules and acini, and lead to atrophy and fibrosis.

A discussion is given of the varied clinical and pathologic manifestations of this disease which, in the authors' opinion, can be more nearly explained by this hypothesis than by any of the other current theories. To corroborate this, they have attempted to extract secretin (S_1) from postmortem specimens of the upper part of the intestinal tract. To date they have been consistently successful in 13 children except premature and newborn infants and except a single infant who had fibrocystic disease of the pancreas. 28 references.

(This paper is stimulating but the conclusions, based on a single case, should be regarded as tentative. Control cases with a degree of chronic malnutrition comparable to that found in fibrocystic disease are needed. It is difficult to explain the occasional cases of fibrocystic disease with inspissated secretion in the liver, gall bladder, intestinal or salivary glands on the basis of secretin in the liver, gall bladder, intestinal or salivary glands on the basis adults dying with cachexia is valid but the histologic changes do not closely resemble those of fibrocystic disease.—ED.)

10. Genito-Urinary System

See Contents for Related Articles

11. Growth, Puberty, Adolescence

The Effect of Glutamic Acid Upon the Mental and Physical Growth of Mongols. Frederick T. Zimmerman, Bessie B. Burgemeister, Ph.D. and Tracy J. Putnam, Columbia University College of Physicians and Surgeons and the Neurological Institute of New York, New York, N. Y. *Am. J. Psychiat.* 105: 661-68, March 1949.

A study and comparison was made of the results of feeding glutamic acid to 30 cases of mongolism and 30 control cases of nonmongoloid retardation. All experimental cases had IQ's below 80 and the control cases were selected to match the initial IQ levels of the experimental group. Both groups were also matched as closely as possible for chronological age. The cases ranged from 3 to 35 years of age. Four were above 20 years. Glutamic acid was given in gradually increasing doses "to the point where an optimum increase in motor and psychic activity was apparent. This dose is then maintained or reduced slightly if too much activity is evoked". The effective

dose ranged between 24 and 36 Gm. per day and was arrived at empirically for each case. A wide range is found between the minimal effective dose and the optimal dose. The optimal dose is judged to be one just short of the amount required to produce distractibility or aimless physical activity. Prior to glutamic acid treatment each patient was given the Stanford-Binet intelligence test, Form L, 1937 revision; the Merrill-Palmer performance scale; and the Rorschach ink blots. This battery of tests was repeated six months after glutamic acid therapy. On the Stanford-Binet test the average mental age for the mongoloid group before treatment was 5 years, 4 months, and the intelligence quotient was 46. After six months of glutamic acid therapy the intelligence test indicated an average gain of eight months in mental age. The average intelligence quotient was raised from 46 to 50. Individual point rises in retest intelligence quotient ranged from zero to 20 points. Gains in motor tests were not striking.

For the nonmongoloid control group the mental age rose from 5 years 5 months to 6 years 5 months after 6 months of glutamic acid therapy. Performance test results indicated a gain of 9 months in mental age. Height and weight records were kept of some of the mongoloid children for whom these measurements were known for two years prior to glutamic acid treatment. For height, the average gain in two years for 6 cases under 18 years of age was 2.63 inches or 0.68 inches per 6 months. The average gain in six months for these cases while receiving glutamic acid was 2.56 inches for the six months. The average gain in weight in the two years prior to therapy was 5.4 lbs. or 1.35 lb. per six months. The average gain in weight during six months of treatment with glutamic acid was 4.46 lb. for the six months. Data were not collected on the effect of glutamic acid upon height and weight in nonmongoloid mental retardation. The physical improvement in the mongols was not confined to increase in height and weight alone. The texture of the skin and hair frequently improved. A number of cases had more alert facial expressions. 11 references. 6 tables. 5 figures.

(Mongolism seems to be a clinical syndrome representing widespread interference with fetal development at a very early period and several forms of treatment, introduced hopefully, have proved unsuccessful. Physical growth, as measured by height and weight, was stimulated by feeding this group of mongoloid patients large doses of glutamic acid but the resultant increment in mental growth, while seemingly significant, was small. This report is of great interest; it is important, however, that these results be confirmed on a larger series of such patients and for longer periods of time before too much is promised for the treatment.)

The value of glutamic acid as a therapeutic agent in mental retardation has not been universally accepted. Many more studies of the type summarized here are needed, and by authors other than those who first proposed this treatment.—ED.)

12. History, Biography, Antiquities

See Contents for Related Articles

13. Infectious Diseases, Acute

On the Etiology of the So-Called Virus Diarrhea of the New Born. *J. D. Verlinde, Leyden, Holland.* Maandschr. v. Kindergeneeskunde 16, 9, 385-95, 1948.

In the Netherlands in recent years epidemics of diarrhea among babies have occurred in which no pathogenic bacteria could be demonstrated. In 3 such epidemics Verlinde has tried to isolate a virus, using defibrinated blood and suspensions of feces, filtered and non-filtered. Inoculations were performed in rabbits, guinea pigs, mice, young dogs, ferrets, hamsters and chick embryos. Symptoms could be produced only in young ferrets at the age of 3 to 8 weeks. Eleven young ferrets, 3 weeks of age, which received feces filtrates orally, developed diarrhea and died after 1 to 3 weeks. The intestines of the dead animals were ground, suspended, filtered and inoculated orally in 5 ferrets of 5 weeks old; four of them died within 4 to 7 days; the fifth fell ill, but recovered. Twelve ferrets 3 to 6 weeks of age were then inoculated with filtrates of feces suspension. Three of these received simultaneous injections of convalescent serum; two remained well, while the third exhibited diarrhea but recovered. The 6 non-treated ferrets and the 3 ferrets in whom control serum had been injected died after three to nine days. The findings at autopsy were: degeneration of the epithelium of the intestinal mucose and mononuclear perivascular infiltrates in the liver. Repetition of the experiments on a larger scale could not be performed because of shortage of young animals. Ferrets older than 8 weeks showed either no morbid symptoms or a diarrhea from which they recovered quickly. 9 references. 1 table.—*M. R. Stoppelman.*

(Most outbreaks of epidemic diarrhea yield no causative organism when carefully studied. Sometimes true bacterial epidemics can be demonstrated—the most commonly encountered bacteria being strains of salmonella or shigella or mixed organisms from contaminated nipples and bottles. Strains of *Esch. coli* and other coliform organisms seem sometimes responsible. The failure to uncover bacterial agents in gastroenteritis outbreaks has made it seem probable that some viruses should be responsible. Intensive searches have been carried out by many workers, but only a half-dozen times has any suspicious virus been recovered. The fact that some recorded outbreaks have occurred at a time when influenza or "gastric flu" were epidemic within the population at large has been taken as indirect evidence of a virus origin for those outbreaks. Light and Hodes transmitted a diarrhea-producing virus to calves from stools collected during epidemics in 1941 and 1942 in Baltimore and Washington. Cummings (1947) believed he recovered a similar agent. Buddlingh and Dodd (1943), and Meiklejohn (1947) were able to induce transmissible lesions on rabbit corneas from the rectal contents of affected infants, but there is doubt whether this technic is epidemiologically reliable. No other demonstrations of virus recovery are on record. Verlinde's success in

transmitting the disease to young ferrets is of great importance if it can be substantiated, for it points the way to developing the use of convalescent or even "hypermune" serum as therapy.—ED.)

A Study on Typhoid Fever In Children In Kweichow. *Yung-En Kao, National Kweiyang Medical College and Hospital, Kweichow, China. Chinese M. J. 66: 391-97, July 1948.*

Of 126 cases of typhoid and paratyphoid fevers in children in Kweichow, China, 48% occurred under 5 years (19 cases under 2), and 52% from 6 to 12 years. The disease was prevalent throughout the year but commoner in the summer and autumn. Seventy-two children showed gradual onset, while 54 cases began abruptly. Fever, anorexia, constipation, cough, general malaise, headache and abdominal pain were the chief complaints. In mild cases the fever lasted 11 to 35 days, and in the severe type from 36 to 133 days. Delirium, drowsiness or convulsion was rarely seen. Rose spots were found in 14%, mainly on the chest, abdomen and back, from 5 to 22 days after the onset. In 28% a soft systolic murmur appeared. The spleen was enlarged in 34% and the liver in 24% of the series. Anemia became apparent in the third week. In 38% the white blood count was below 5,900 and over 9,000 in 20%. The Widal reaction was positive in all cases; the blood culture was positive in 13 of 38 specimens and the stool culture positive in 5 out of 68. Four cases of paratyphoid A and B are included in the series. The course of each case lasted from two to four weeks with milder symptoms than ordinary typhoid fever. Four deaths occurred, one each from agranulocytosis, typhoid meningitis, bronchopneumonia with noma and dehydration, and bronchopneumonia. The child who died from agranulocytosis had taken sulfadiazine daily for 13 days before admission. The cause of his death was believed due to the drug rather than the disease. 22 references. 6 tables.—*C. L. Kao.*

Clinical Manifestations of the Severe Form of Diphtheria. *A. Murray Fisher and Sidney Cobb, Johns Hopkins University School of Medicine, Baltimore, Md. Bull. Johns Hopkins Hosp. 83: 297-325, Oct. 1948.*

Diphtheria has shown a marked increase in prevalence in the past few years. This rise lasted for about three years in Baltimore and vicinity, reaching a peak in 1946 and then declining. The observations in 30 cases (older children and adults) are tabulated and discussed with reference to the clinical and laboratory features. There was a high incidence of myocardial involvement. Twelve of the 30 patients had a previous history of immunization against diphtheria. Similar experiences have been reported in other outbreaks. The inaccuracy of the virulence test as routinely employed is indicated by the fact that 6 of the 30 strains of diphtheria bacilli isolated were reported as avirulent. The average duration of the acute infection from onset to the time antitoxin was given was 4.7 days. This delay in therapy was probably the most important cause of serious complications or death.

The treatment of diphtheria has three parts: 1) neutralization of the circulating toxin as rapidly as possible; 2) relief of obstructive symptoms; 3) maintenance of an efficient circulatory system. When the diagnosis of diphtheria is suspected, the patient should be tested for sensitivity to horse serum. If the tests are negative, the antitoxin should be given at once. If the tests are positive the antitoxin is given in small and increasing doses at intervals of approximately one-half hour until the total amount has been reached. The usual method of administration is serum given intramuscularly to patients who are moderately ill, and intravenously when the infection is more severe. The total dose is usually given in one injection. In this group of severely ill patients the dosage varied from 40,000 units to 220,000 units, with an average of 120,000. Except for one patient, who received 40,000 units, the minimum dose was 80,000, even in the case of small children. Despite this probable excess of antitoxin, the progress of the myocarditis in many of the patients was not obviously altered. Early tracheotomy is important before cerebral anoxia has developed and the child has become fatigued from severe and prolonged respiratory effort. Aspiration by suction or bronchoscope often produces dramatic improvement. An oxygen tent is frequently necessary. The atmosphere in the tent should be saturated with water vapor and kept preferably at body temperature. Digitalization is not only safe when carried out carefully but may be of real benefit, even during the acute phase of myocarditis, and is not contraindicated by damage to the conduction system. The treatment of fully developed "shock" has on the whole been unsatisfactory in patients who are critically ill. Oxygen is given and a cautious attempt may be made to support the circulation with intravenous fluids. Fifty per cent glucose, ascorbic acid and adrenal cortical hormone have not given evidence of any real benefit. Penicillin is given intramuscularly with the added purpose of counteracting other bacterial infections, and possibly to decrease the amount of toxin produced by direct action on the diphtheria bacilli. There were no indications that the course of the diphtheria itself was altered by penicillin.

The importance of immediate therapy with antitoxin is brought out in a striking manner by the case histories. The development of severe diphtheria, with myocardial damage and often death, seems more closely related to delay in diagnosis and treatment than to any other factor, though differences in strains and host susceptibility are also important. When the toxin is not neutralized in the early stages of the infection it appears to be taken up by some of the body cells; once combined with the cells, damage may progress despite introduction of antibodies into the blood stream. The majority of the clinical findings may be explained on the basis of damage by the toxin to such organs as the heart, the nervous system or the adrenals. In addition, serious respiratory complications result from local membranous lesions. Cervical edema producing the bullneck swelling is not due to bacterial invasion, but more likely to local spread of the toxin.

Studies are needed to determine the adequacy of present immunization procedures, and the amount of antitoxin necessary to guarantee an excess in the blood as long as toxin circulates. Another interesting problem relates to the mechanism of the toxin's intracellular action. The fact that damage to susceptible cells develops slowly to the point of clinical recognition, and even more slowly to obvious pathologic changes, suggests that the metabolism of the cells is altered by the diphtheria toxin in some subtle but progressive manner. The medical profession must be more alert toward recognition of diphtheria in all age groups, whether there is a history of previous immunization or not. 9 references. 1 table.

Prenatal Diphtheria Immunization. *Michael A. Brescia and Edward F. Tartaglione, St. John's Long Island City Hospital, Queens, N. Y. Arch. Pediat. 65: 633-39, Dec. 1948.*

Of 273 pregnant women who were Schick tested, 40% proved Schick positive. Nineteen of these were immunized with alum-precipitated toxoid in 5 doses, beginning with 0.1 cc. and finishing with 1.0 cc. These were all converted to Schick negative and their newborns were all Schick negative. Six other women with a history of diphtheria immunization during childhood received a single injection of 0.25 cc. of alum-precipitated toxoid as a "booster". These were all converted to Schick negative and all their newborns were Schick negative. In one of these mothers a second infant, born a year later, was also Schick negative. Thirteen per cent had severe reactions to the first injection of alum toxoid. Only 4% had severe reactions after the second injection of 0.25 cc. There were no severe reactions obtained with the third to the fifth injections despite the larger doses used. It is recommended that infants born of Schick negative mothers be immunized at 6 months of age, whereas, those born to Schick positive mothers should be immunized at 1 month of age. 16 references. 3 tables.

(Because of severe reactions in adults, many physicians prefer the early immunization of infants to the prenatal immunization of mothers. Although the primary response to active immunization with toxoid is not as good in those infants who have carried over maternal antibody, after the first "booster," six to twelve months later, they have as high a titer as those who had no maternal antibody.—ED.)

An Outbreak of Nausea, Vomiting and Diarrhea on a Maternity Service; Transmitted to a Child Caring Institution and to Private Homes. *Harold Abramson and Harold T. Fuerst, New York, N. Y. and Kew Gardens, L. I. Pediatrics 2: 677-84, Dec. 1948.*

An epidemic of nausea, vomiting and diarrhea developed on the maternity service of a general hospital from Aug. to Nov. of 1946. Following the initial case, a mother four days post partum, 32 additional mothers among 600 at risk became similarly affected during the next 3½ months, an attack rate of 5.5%. Diarrhea developed in a newborn infant one week after. The second baby became ill nine days later. Subsequent cases

appeared rapidly thereafter, with a final attack rate of 19.4% among 586 infants at risk. Fifty nurses also became ill, from the maternity wards, nurseries, pediatric wards and other parts of the hospital.

A second outbreak occurred in a modern institution giving temporary shelter to infants from 2 weeks to 6 years of age. The source case was a ten-day-old infant who had been cared for in the maternity hospital and then transferred to the infants' home. Among 58 infants and children who were exposed, the attack rate was 48.3%. Four nurses and one teacher also became ill. No illness occurred among 21 additional adults comprising the administrative and clerical staffs, and the food handlers. The onset of infection was sudden in the adults, with nausea, vomiting, abdominal discomfort and watery diarrhea, lasting one or two days. The clinical picture in the older infants and children was similar. Second and third attacks were seen in this group. In the newborn infants the onset was insidious and vomiting was infrequent. The diarrhea varied from mild to moderately severe, with no blood or mucus. Dehydration was minimal or absent. Weight losses were small. Other constitutional signs were lacking. Eleven newborns had fever ranging between 37.7°C. and 40°C. The duration of illness was two to four days. No complications or deaths occurred. The average incubation period was two to three days, with a range from one to 21 days. The infants responded to ordinary therapeutic measures. Bacteriologic studies of the stools, formulas and nipples gave no significant findings. No virus studies were made. The clinical picture in the newborn infants bore no similarity to true epidemic diarrhea of the newborn. The spread to older infants, children and adults is also unlike true epidemic diarrhea of the newborn. Salmonella and shigella infection were ruled out by the negative stool cultures. The epidemiologic implications of the epidemic are obvious. 23 references. 2 tables. 2 figures.

(Epidemics similar to that described above have been widespread in Philadelphia as well as in New York City, and probably elsewhere. More often than not, the adults in the family were more ill than the infants, or felt more sorry for themselves, at any rate. Fortunately the illness was self-limited, of short duration, and rather mild—doubly fortunate since the attack rate was so high. Each year every large community experiences wave after wave of epidemics which are usually called "grippe", with various distinguishing adjectives. Each epidemic has its own peculiar individuality which distinguishes it clinically from the others. With one there is diarrhea, or even abdominal pain without diarrhea. With another there may be rhinitis, or protracted cough, or both. Still another will set in abruptly with high fever and little else. With some, laryngitis is the rule, with others bronchitis or pneumonia, otitis media, simple myringitis, cervical adenitis, or tonsillitis. Surely each of these is caused by a specific and highly selective organism. Mixed with them often are such partially known diseases as true influenza, roseola infantum, "primary atypical pneumonia", and epidemic diarrhea of the newborn. Epidemiologists could learn much from practicing

pediatricians. Virologists have an infinite scope for their efforts. For the time being, the observing practitioner is the expert in this field, if one can speak of experts at all.—ED.)

Results of Schick Testing Three Years after the Injection of Protamine Diphtheria Toxoid. *Victor Ross, College of Physicians and Surgeons, Columbia University, New York, N. Y. Am. J. Dis. Child. 77: 450-53, April 1949.*

A single dose of protamine diphtheria toxoid was given to 121 small children with positive reactions to the Schick test. After three years, 114 (95%) had a negative reaction, 6 had a positive reaction and 1 had a pseudopositive reaction. None had known contact with a case of diphtheria nor had received an intervening Schick test. Two doses of protamine toxoid is recommended for more permanent immunity. 10 references.—*L. V. dos Remedios.*

Asexual Syphilis in Children. *Henry Eisenberg, United States Public Health Service, Frederick Plotke and Amelia H. Baker, Chicago Department of Health, Chicago, Ill. J. Ven. Dis. Inform. 30: 7-11, Jan. 1949.*

This study shows that the incidence of a sexually acquired syphilis in children is much higher than ever before suspected, and is based on a survey made at the Municipal Social Hygiene Clinic of the Venereal Disease Control Program, Chicago Health Department, during the year 1947. Twenty cases of asexually acquired syphilis in children under 10 years of age were encountered during 1947. There were 16 girls and 4 boys. The average age was below 5 years; 4 children were siblings from 2 different families. In every case one other member of the immediate household had been diagnosed as having secondary syphilis. None of the 20 infected children showed a primary lesion upon examination, confirming the belief that extragenital chancres are smaller in children than in adults. It was noted that overcrowded home conditions and lack of education in hygienic matters favor the spread of syphilis asexually among children exposed to adults ill with infectious syphilis. All children in such families should be followed for three months from the last date of exposure, by general physical examinations and repeated serologic tests for syphilis. 5 references.

Myocarditis and Pericarditis in Meningococcic Infections. *Charles Upton Lowe and Louis K. Diamond, Harvard Medical School, and Children's and Infants' Hospital, Boston, Mass. Am. J. Dis. Child. 75: 660-70, May 1948.*

This is the first report of a child with myocarditis and pericarditis as a complication of meningococcic infection. A 13 year old girl was treated for meningococcic meningitis and meningococcemia. The initial response to penicillin and sulfadiazine was good. On the fifth day, however, cardiac complications ensued: tachycardia, difficult breathing, left-sided chest pain, pericardial friction rub and a paradoxical pulse. The electrocardiographic and roentgenographic alterations were consistent with a diagnosis of

pericarditis. Pericardiotomy was performed on the tenth day. The parietal pericardium was edematous; there were adhesions and fibrin, but no free pericardial fluid; there were several necrotic epicardial lesions. The child then developed cardiac dilatation and failure, but responded to restriction of fluids and salt. Clinical, roentgenographic and electrocardiographic recovery was ultimately complete. 14 references. 1 table. 4 figures.—*B. J. Shuman.*

The Roentgen Manifestations of Pancreatitis Complicating Mumps. *M. H. Poppel and Celia Bercow, New York, N. Y. Am. J. Roentgenol. 61: 219-22, 1949.*

Of 95 consecutive cases of mumps 17 had signs and symptoms referable to the pancreas—acute in 3 children and subacute in the others. The 3 acute cases and 11 of the 14 subacute cases were studied roentgenographically for signs of pancreatitis, which include marked intolerance to barium in the duodenal loop, elevation of the stomach, restricted motion or freezing of the left dome of the diaphragm and coarsening of the duodenal mucosal pattern. All of the acute cases and 7 of the 11 subacute cases examined showed such roentgen evidence of pancreatitis. 5 references. 7 figures.—*M. Maresh.*

Treatment of Scarlet Fever. A Comparison of Gamma Globulin with other Therapeutic Agents in 1,667 Cases. *J. F. Landon and S. J. Jackson, Willard Parker Hospital, New York, N. Y. and U. S. Public Health Service Hospital, Sheepshead Bay, N. Y. Am. J. Dis. Child. 76: 60-72, July 1948.*

The initial effect of 40 ml. of human gamma globulin given intramuscularly to 103 children and 135 youths with severe scarlet fever (fever above 102 F. or toxemia) was good or excellent in 63% and 89%, respectively. The temperature remained normal after 48 hours, the rash faded rapidly and except for sore throat the subjective symptoms subsided. No significant local or general reactions were observed. Eighty-one children received 9,000 or 27,000 units of streptococcus antitoxin intramuscularly with good results in only 45 per cent; in 79% an asymptomatic, postcritical fever, possibly a serum reaction, arose between the sixth and eighth day after injection. Gamma globulin did not prevent the appearance of early complications (mainly otitis media, adenitis and sinusitis) in severe cases but was effective in the mild ones. An extra dose of 20 ml. on discharge seemed to be beneficial. Sixty to 120 ml. of human scarlet fever immune serum given intravenously to 241 youths and full doses of sulfadiazine given orally to 466 youths were not more effective than symptomatic treatment alone in 335 mild and severe cases. No cases treated with gamma globulin developed late complications, whereas 20 cases of rheumatic fever and 7 of acute glomerulonephritis followed 1,042 other cases regardless of treatment. Three youths died of septic complication among 1,201 cases in which human immune serum or sulfadiazine was used. There were no deaths in the group of 159 who received gamma globulin. 8 references. 2 charts. 4 tables.—*L. V. dos Remedios.*

14. Infectious Disease, Chronic

The What, How and Why of the International Tuberculosis Campaign. *Bulletin issued by Public Relations Office, International Tuberculosis Campaign, Copenhagen, Denmark. Dec. 1, 1948.*

A campaign has been planned and is already well under way to test more than 100,000,000 children and young adults throughout the world for tuberculosis. Those who require it will then be given BCG vaccine. This, the largest mass-immunization campaign ever undertaken, is a joint international effort of the UNICEF (United Nations International Children's Emergency Fund) which is providing most of the supplies and equipment; the Danish Red Cross, Swedish Red Cross and Norwegian Help for Europe, which are providing specially trained physicians and nurses; the Ministry of Health in each country where the campaign is conducted, which provide national medical teams and facilities; the World Health Organization, which is setting standards, providing technical advice and assistance, and evaluating the results; and the National Red Cross Societies, which are assisting locally in the individual countries where the campaign is conducted. Twenty-one countries had been approved for the program by Dec. 1, 1948. In Czechoslovakia, Finland, Greece, Hungary, India, Poland and Yugoslavia the campaign is already under way. The other 14 countries which are eligible and which will probably begin their campaigns in 1949 are Albania, Austria, Bulgaria, Italy, Rumania, Ceylon, China, Pakistan, Algeria, Morocco, Tunisia, Egypt, Lebanon and Mexico. Other countries of Asia and the Western Hemisphere may later participate.

As of Dec. 1, 1948, nearly 5,500,000 European children and young adults had been tested, and about 2,000,000 had been vaccinated. The campaign is advanced furthest in Poland and Czechoslovakia where about 25% of the goal has already been reached. The total scheduled for testing over the world will be well over 100,000,000.

The destruction caused by the recent war created or magnified conditions favorable for the rapid spread of tuberculosis in all countries which suffered from the war. Crowded living conditions, defective nutrition and poor hygienic facilities have resulted in many countries from the wartime destruction of hospitals and clinics, the disruption of public health services, and the drastic curtailment in the number of doctors and nurses. There has also been a serious interruption in the exchange of scientific information on latest methods of combating tuberculosis. The public health figures which are available show, for example, that in Vienna the death rate from tuberculosis in 1946 was double the rate in 1938, and the new cases reported in 1946 were more than four times the number in pre-war years. By 1944 the death rate in Warsaw was more than three times the rate in 1938. In 1946, about 50,000 persons in Poland died of tuberculosis. In India the annual number of deaths is over 500,000 and the number of open cases of the disease is believed to be over 2,000,000. In other countries there is every indication that the increases are just as serious in some places reaching epidemic proportions.

The financing of the BCG vaccination campaign is on a joint international basis. UNICEF has allocated \$2,000,000 for use in Europe and \$2,000,000 for countries outside Europe. The Danish Government has contributed about \$120,000 to UNICEF for this program. It is hoped that a campaign by UNAC in Denmark will yield the equivalent of about \$2,000,000 or more. Norwegian Help for Europe is contributing about \$300,000. The Swedish Red Cross has made a first contribution of about \$110,000. Each participating country is paying most local costs, which in most cases are substantial. The World Health Organization (WHO) is paying for large-scale medical research projects to evaluate the results. The expenses of the campaign outside Europe will be met primarily by UNICEF and the individual governments. Denmark began an anti-tuberculosis vaccination action in 1947 in a number of countries of Europe. The Danish Red Cross sent teams for large-scale BCG mass vaccination into Poland, Germany and Hungary, and demonstration teams into Yugoslavia, Czechoslovakia, Austria, Italy, and Greece. National and local authorities in those countries cooperated. In 1947, more than 1,000,000 persons were tested and over 200,000 were vaccinated. The Danish State Serum Institute provided the necessary vaccine and the tuberculin for infection-testing.

The WHO's Expert Committee on Tuberculosis has given special technical guidance from the inception of the UNICEF-Scandinavian Campaign. The WHO will undertake a large-scale medical research program in connection with the vaccination campaign, as part of the WHO long-range program of tuberculosis control. Among the specific projects are: investigation of testing and vaccination methods; criteria for vaccination and re-vaccination; research on the effectiveness of the vaccination; studies of tuberculosis susceptibility; basic research on tuberculosis as a clinical, epidemiologic and public health problem. Since 1930 the Danes have been particularly interested in BCG vaccination by injection, especially for older children and young adults, because it is among those groups that the incidence of tuberculosis is highest. An effort is now being made in the Scandinavian countries to vaccinate all older children and young adults who require it. In Norway a law was passed in 1947 giving the Ministry of Social Affairs authority to order BCG vaccination wherever advisable. In the U.S.S.R., practically all newborn infants have been "vaccinated orally" with a BCG vaccine in recent years. Australia has recently launched an extensive vaccination campaign. The vaccine has also been employed to a limited extent in South America, Canada and the United States. In the world as a whole, well over 5,000,000 persons have been BCG-vaccinated to date.

The tentative conclusions from BCG experience to date are that BCG vaccination does not give absolute protection, but can reduce greatly the danger of active disease. Protection usually lasts for several years. BCG vaccination can reduce new cases of active tuberculosis by about 80%. It will, in the long run, help substantially to reduce mortality from tuberculosis, particularly in countries which do not have adequate control and

treatment facilities. The financial savings in tuberculosis treatment will be tremendous. For example, the Ministry of Health of Czechoslovakia has estimated that the vaccination campaign will ultimately save that country over \$100,000,000 annually in treatment, loss of earning power and other costs of the disease. BCG vaccination is also beneficial for adults who have a negative reaction to the tuberculin test. Because of the limitations of funds and resources the International Tuberculosis Campaign generally covers children and adolescents 18 years of age and under. In some countries, however, it is extended to persons of 20, or even older, depending upon the national tuberculosis situation. The European countries in the campaign receive fresh vaccine and tuberculin by air from the Danish State Serum Institute each week. The Pasteur Institute in France will provide the vaccine for North Africa. More distant countries will have to produce their own BCG because of shipping problems and keeping qualities of the vaccine. The King Institute of Madras, India, will soon be able to produce large quantities of BCG, and laboratories in Peiping are hoping to do the same for China. European countries will also employ their own BCG when they can begin production, and when their vaccine is approved by the WHO Biological Standardization Committee. The campaign agreement with each country provides that there shall be no discrimination because of race, creed, nationality or political belief, and that the testing and vaccination shall be free of charge. A record is kept of every test and vaccination, for later use in the country's own antituberculosis program and for statistical purposes. It is estimated that a skillful vaccinating team (consisting ordinarily of 1 doctor and 2 nurses), can tuberculin-test and perform the necessary vaccinations for 20,000 persons per month. Of those tested, between one-third and one-half will require vaccination.

Of course, vaccination is not enough. A complete campaign against tuberculosis calls for many additional procedures. Ideally, each child found to be "positive" to the tuberculin test should be examined by x-ray. The definite diagnosis must be based on demonstration of tubercle bacilli. Because the resources of the International Tuberculosis Campaign do not permit these measures, the Scandinavian relief organizations are trying to assist other countries by additional procedures. The Danish Red Cross plans to devote funds to assist in organizing and equipping laboratories, and in graduate medical education. An international tuberculosis institute and club for physicians has been established in Copenhagen. The Swedish Red Cross is conducting an anti-tuberculosis program in Germany and elsewhere in Europe, with mass roentgenography and supplies for tuberculosis dispensaries. Among other things which are necessary in most European and Asiatic countries are expansion of public health services; training of doctors, nurses and public health officials; more hospital beds for contagious cases and new sanatoria and convalescent centers; provision of adequate surgical equipment and medical supplies; expansion of social welfare services; and, most important, raising the standard of nutrition and general living conditions.

(The BCG anti-tuberculosis program is progressing according to schedule in most of Europe and North Africa. It was officially launched in July 1948. By the end of March 1949 some 8 million children and adults had been tested and about 4 million vaccinated. In Greece, Yugoslavia, Romania, Austria, Italy, Algeria, Morocco, Tunisia, India, Pakistan, Lebanon, Egypt, Israel, Iran and Ceylon local conditions are such that the campaigns have been slower in getting started. Technical and administrative difficulties are being encountered in Hungary. Requests have been submitted by Bolivia and Ecuador for BCG programs, but there are many problems in regard to the establishment of such vaccination in these countries, one of which is the relative difficulty of flying vaccine from one country to another. Under terms of the agreements signed with the governments, the Joint Enterprise assumes technical responsibility for the duration of the campaign; while the national government assumes moral and administrative responsibility. As the Joint Enterprise terminates mass vaccination in a given area, the government takes over and assumes all responsibilities. Governments of all countries under the Joint Enterprise desire to have BCG vaccine produced by their national laboratories by the time the Joint Enterprise Campaign in their countries comes to an end. In most countries arrangements are under way to ensure such production. The question of equivalence of the national vaccine to that used by the Joint Enterprise will be determined by the WHO Expert Committee on Biological Standardization.—ED.)

The Duration of Immunity After Vaccination with BCG. *Ole Waczhöckert, Norrtull's Hospital, Stockholm, Sweden. Acta paediat. 35: 89-107, Fasc. 1-2, 1948.*

A study was undertaken to determine the duration of immunity after vaccination with BCG. Tuberculin sensitivity was used as a measure and a 1 mg. Mantoux test was considered positive when, after 72 hours, the redness and infiltration measured 10 x 10 mm. or more. The investigation covered 1702 children who were tuberculin tested at intervals varying from six months to eight years after BCG vaccination. About half of the children had been vaccinated before the age of 3 months, and about three-quarters before the age of 3 years. After two years the test was negative in approximately 10%, and after six years in about 20% of those who were vaccinated. In those children who lived in a tuberculous environment the incidence of positive tests was higher than in those who were not so exposed, the difference being attributed to superinfection. The high incidence of negative tests after the lapse of only a few years indicates the need for a tuberculin test every one or two years. 25 references. 7 tables.—I. Morgenroth.

(Although the tuberculin reaction is the only available test which might measure immunity, there is no conclusive evidence that tuberculin sensitivity and immunity run parallel. With BCG vaccination there appears to be no immunity unless the skin tuberculin test becomes positive. Yet it does not follow that an individual who was once tuberculin-positive but has now become tuberculin-negative is correspondingly just as susceptible to tuberculosis as if he never had been once sensitized.—ED.)

A New Test (The Diffusion Index) As a Guide to Local Streptomycin Therapy in Tuberculous Meningitis. (Su di una nuova prova diagnostica (indice di diffusione) come guida alla terapia locale con streptomycinia nella meningite tubercolare). A. M. Comparetti, G. Pasquinucci and A. Zoli, Florence, Italy. Riv. clin. pediat. 46: 439-56, 1948.

The diffusion of intrathecal streptomycin from the lumbar area to higher levels has been studied. Partial or complete block may prevent the drug from reaching critical areas long before clinical signs of such a condition become evident. Timely suboccipital injections have brought about improvement in several of 47 cases of tuberculous meningitis previously showing poor response. A diffusion index (I.D.) has been evolved whereby the concentration of streptomycin in cerebrospinal fluid from the cisterna magna is compared with that from the lumbar area, eight hours following lumbar introduction of 30 mg.

$$I. D. = \frac{\text{suboccipital streptomycin conc.}}{\text{lumbar streptomycin conc.}}$$

A study of several thousand observations indicates that these levels should be equal, i.e., I.D. = 1.0, in this time. A drop to 0.50 is an indication for alternating daily suboccipital and lumbar administration with smaller doses in the latter site. A fall to zero dictates suboccipital therapy with simultaneous but minute doses (10 mg.) given via the lumbar route. Defective diffusion may cause radiculitis due to persistence of medication in the lower region. Some patients treated with intramuscular streptomycin alone also exhibited defective diffusion, so that intrathecal medication cannot be considered wholly responsible for block. 7 references. 7 tables.—A. M. Bongiovanni.

(It has long been recognized that temporary cerebrospinal block, without symptoms, occurs frequently in cases of bacterial meningitis. The method described here, although theoretically valid, necessitates frequent cisternal punctures, a procedure not without danger to the patient.—ED.)

Clinical Studies on Allergy to Tuberculin Following Primary Tuberculous Infection. The Clinical Value of Recognizing the State of Secondary Negative Allergy. Richard T. Ellison. Am. Rev. Tuberc. 58: 463-78, Oct. 1948.

Loss of tuberculin sensitivity following the complete healing of a minimal primary tuberculous infection is known to occur. However other independent changes in the body resulting from such infection and termed "acquired resistance" persist after this loss of allergy. Such a state known as "secondary negative allergy" is to be distinguished from the primary type wherein the tuberculin is negative and there is no acquired resistance simply because there has been no previous infection. Persistent primary negative allergy is probably due to high native resistance and not lack of contact, and is the most desirable state.

Many investigators including those dealing with BCG vaccine have assumed that a negative tuberculin skin test at any age precludes previous

infection with tubercle bacilli; this is a fallacy. Probably at least half the negative reactors among adults are "secondary negative reactors". Such a state explains the occurrence of reinfection type tuberculosis in adults with negative tuberculin reactions, a condition previously attributed to the age itself and once denoted "adult type" tuberculosis. However some individuals lose not only their tuberculin allergy but also their acquired resistance and develop a true secondary primary complex; this is particularly seen among adult negroes. Secondary negative reactors are the most susceptible to exogenous exposure to tubercle bacilli; their native resistance has been inadequate and the addition of some acquired resistance is often not sufficient to protect them from heavy reinfection. It would seem that the most valuable use of BCG vaccine may be to restimulate a declining resistance in this group. 10 references. 1 table.—*A. M. Bongiovanni.*

(Among the many questions which have become more prominent with the popularization of anti-tuberculosis vaccination, one of the most debated is that which relates to whether the changes in tissue reactions which follow sensitization to products of the tubercle bacillus are an asset or liability to the organism as a whole. For this reason there will not be complete agreement with certain of the conclusions drawn above as to the susceptibility of the various groups to infection. Nonetheless the distinction between tuberculin sensitivity and factors of resistance is a recognized one. Experimentally, Sidney Raffel (Am. Rev. Tuberc. 54: 564, 1946) studied the tissue reactions to the carbohydrate, protein, phosphatide and acid-fast wax components of tubercle bacilli individually in guinea pigs. It was possible to induce reactivity to Old Tuberculin regularly with the protein and wax of human tubercle bacilli without developing resistance. Thus the hypersensitive state and resistance are not necessarily associated.—ED.)

Tubercles of the Choroid. *Ronald S. Illingworth, and Trevor Wright, University of Sheffield. Brit. M. J. 2: 365-8, Aug. 21, 1948.*

Sixty cases of miliary tuberculosis with or without tuberculous meningitis and tuberculous meningitis without apparent miliary tuberculosis have been carefully studied and followed for tubercles of the choroid. Pupils were dilated with homatropine and sedatives were given to the children. Examination was repeated a number of times in most patients. In 42 cases of miliary tuberculosis, tubercles of the choroid were seen in 25 or 60%. In 18 cases of tuberculous meningitis without miliary spread, tubercles of the choroid were found in only one case. Moreover, in 33 cases where miliary spread was evidenced by x-ray, 24 had choroid tubercles, whereas in 9 cases where only necropsy showed the miliary spread, only one had choroid tubercles. In most patients the tubercles were found on the first or second examination, not as a terminal phenomenon. It seems that this examination may be a definite diagnostic aid in patients suspected of miliary tuberculosis or tuberculous meningitis.

Because of treatment with streptomycin, it has been possible to observe changes in these choroid tubercles over a period of several months. The

final stage is a scar which is believed to be the healed tubercle. This has been seen in only 5 patients. In 3 of these no other tubercles were seen and these patients are clinically well. In 8 patients with prolonged streptomycin treatment, the tubercles never progressed beyond early stages. Five of these are dead, and the other 3 are not responding well to treatment. In only one patient was a new tubercle observed after prolonged streptomycin treatment. This, naturally, is a bad prognostic sign. In addition, 4 patients without evidence of miliary spread or meningitis were found to have choroid tubercles. The presence of choroid tubercles may be of definite diagnostic aid in patients suspected of miliary tuberculosis. Continued observation of changes in choroid tubercles may in the future be shown to be of prognostic value in patients treated with streptomycin. 40 references, 2 tables, 6 figures (1 color plate).—*F. Hertzmark.*

(This report emphasizes the advisability of careful and repeated examination of the eyegrounds in suspected cases of miliary tuberculosis. The finding of one or more tubercles may decide the diagnosis.—ED.)

15. Liver, Kidneys, Spleen

Fatty Liver Disease in Infants in the British West Indies. *J. C. Waterlow.* Medical Research Council, Special Reports Series No. 263. London, His Majesty's Stationery Office, 1948. 84 pp., 2 Shillings net.

In Trinidad, British Guiana and Jamaica a disease syndrome is seen in infants under 2 years old which is characterized by edema, muscular wasting, and fatty infiltration of the liver. It is estimated that in Jamaica alone, with a population of 1,250,000, several hundred cases occur each year. In some years the incidence is said to reach epidemic proportions. Fifteen affected infants were found and studied. Their average when first seen was 10½ months; ten were in the second six months of life. Most were in unsatisfactory home situations, usually with the father away and the mother working outside the home. All had been breast fed from birth. Usually the symptoms began after weaning. The principal food after weaning was porridge made of maize, arrowroot, sweet potatoes, plantains or oatmeal. This was generally supplemented with fruit juice, sometimes green vegetables and usually half a pint of milk per day or less, either fresh cow's milk or sweetened condensed milk. Nearly all the infants also received infusions of leaves and herbs.

The presenting complaints were edema and vomiting. Diarrhea was not present. The babies were usually below normal weight but the degree of weight loss was less than in many other cases of simple undernutrition. There was gross muscular wasting but the subcutaneous fat was not completely lost. When first seen all babies exhibited moderate enlargement of the liver. The edge was rounded and the surface smooth. After admission to the hospital vomiting often persisted and there was a tendency to respiratory infections. The mortality was high (5 out of 15 cases) and in 4 of these primary cause of death appeared to be hepatic failure. The blood showed a moderate hypochromic anemia. The serum protein concentration

in 8 of 14 cases was less than 4.5 Gm. per 100 cc., the reduction being mainly in the albumin. There was a slight increase in circulating bile pigment. The bromsulphalein test showed abnormal retention of the dye in all cases. The urine was normal. The gastric juice showed normal hydrochloric acid content. The stools contained an unusual amount of fat (average 53.6% of the dry weight) but the proportion of split fat was normal. There was no evidence of any relation to malaria, syphilis, or intestinal parasites, although hookworms were found in 4 of the 5 fatal cases. At autopsy the liver was yellow and firm, with every cell distended by a large globule of fat. The same lesion was demonstrated in nonfatal cases by means of liver biopsy. Excess iron was also demonstrable by staining. The content of fat in the liver varied from 24.6 to 49.5% of the wet weight. Treatment was attempted with various substances. Neither methionine, choline nor inositol in customary doses seemed to exert any benefit, but a high intake of milk seemed to result in improvement.

It is suggested that the edema in this disturbance is secondary to the hypoproteinemia, which in its turn results from a diet low in protein but with ample content of carbohydrate. Diminished formation of plasma proteins by the liver may contribute to the hypoproteinemia. Studies of other infants in the communities led to the conclusion that the first stage in children who do not die is cirrhosis of the liver. The accumulation of iron in the liver probably indicates inadequate utilization. The pathogenesis of the steatorrhea is not clear. Inasmuch as the infants were not being starved, it is thought that the liver fat was exogenous in origin. Failure of improvement from vitamins and lipotropic substances such as choline and methionine suggests that there is no known vitamin deficiency. Experiments with dogs fed high calorie diets low in protein indicate that the fatty liver in these children may be due to protein or amino acid deficiencies. Two stress factors may be of importance in producing or aggravating the fatty change: increased need of protein for growth, and overfeeding with carbohydrates. Cirrhosis of the liver in children is common in the same areas in which fatty liver disease is most frequently found. It seems likely that this cirrhosis, which is of the Laennec type, is the end result of such fatty infiltration. This would then be an example of true dietary cirrhosis in man. 214 references, 12 plates, 11 tables.

(This interesting disease described in infants from the British West Indies is quite similar to the so-called infantile cirrhosis reported in infants in India. Hypoproteinemia certainly appears to be a major inciting factor and is probably secondary to dietary deficiencies. However, an infectious process, possibly viral in origin, may be responsible in part for damaging both the liver and pancreas. This would account for deficient protein synthesis and for the unexplained steatorrhea. Infantile cirrhosis in India occurs in wealthy families where the diet is apparently adequate. In these infants the onset of illness is closely related to the beginning of artificial

feeding. An infectious agent may be introduced through improperly prepared feedings. It is perhaps more than coincidental that the liver disease makes its appearance at a time when passively transferred antibodies from the mother are disappearing from the infant's blood. It is conceivable that essentially identical cases are occurring sporadically on the American and European continents without their similarity being recognized.—ED.)

The Therapeutic Use of Peritoneal Lavage for Anuria Caused by Toxic Nephritis. *E. A. Moody, University of Rochester, School of Medicine, Rochester, N. Y. J. Pediat. 33: 710-16, Dec. 1948.*

An 11 month old infant with severe necrotising pneumonia complicated by toxic nephritis and anuria is reported. The infection, anemia and acidosis were treated with the usual methods, and the anuria and azotemia by peritoneal lavage. A modified Tyrode's solution with glucose and penicillin was given intra-peritoneally by a mushroom catheter, and removed by pump. During the course of the peritoneal lavage a progressive fall in blood non-protein nitrogen was recorded, as well as improvement in the balance of blood electrolytes. Death resulted from septicemia caused by *B. aerogenes* secondary to postoperative herniation of the small bowel through the sump pump incision. Postmortem examination revealed mild fibrinous peritoneal adhesions but no peritonitis. The eviscerated small bowel was hemorrhagic and edematous. Multiple lung abscesses were present. The kidneys were pale, with marked interstitial edema and focal collections of round cells. The tubules in the cortex were dilated and their epithelial cells were flattened and pale-staining. Culture of the lung abscesses and heart's blood revealed *B. aerogenes*. 13 references. 2 figures.—*H. M. Goldstein.*

(Peritoneal lavage is a relatively recent treatment for anuria with azotemia, and for other states of renal failure in which recovery of the kidney can be hoped for if the patient lives long enough. The renal failure must be shown to be due to "lower nephron nephrosis" rather than to simple dehydration with circulatory collapse. Lavage appears justified only after renal function has not returned after several days of conservative maintenance of water and electrolytic balance. During the period of such conservative therapy the fluid intake should not exceed the volume estimated to correct the patient's dehydration plus loss in urine and insensible perspiration. The electrolyte composition and protein content of the plasma must be carefully followed daily and proper adjustments made.

This patient lost considerable protein in the peritoneal lavage. As the author suggests, antibiotics are indicated both systemically and in the infusion fluid to prevent infection. From the data given it is estimated that in this patient the urea clearances reached 10 to 20% of the level obtainable by normally functioning kidneys at this age. The postoperative complication which occurred illustrates that this procedure carries some risk. The artificial kidney, when available, has certain advantages over peritoneal lavage.—ED.)

Electrophoretic Studies of Plasma and Urinary Proteins in Children with Lipoid Nephrosis. *J. I. Routh, E. L. Knapp and C. K. Koboyashi, College of Medicine, State University of Iowa, Iowa City, Iowa. J. Pediat. 33: 688, Dec. 1948.*

Electrophoretic analyses of plasma from 11 children with lipoid nephrosis revealed a decrease in albumin and gamma globulin, and an increase in alpha 2 and beta globulins and in fibrinogen. Urine samples similarly studied contained alpha 1 and beta globulin in addition to albumin. A few urine samples obtained also alpha 2 and gamma globulin. All of the protein contents of plasma except fibrinogen were present in urine.

Inconstant changes in the composition of plasma proteins followed intravenous administration of concentrated human serum albumin daily for long periods of time. In some cases the serum albumin was increased, usually with a decrease in the beta and alpha 2 globulin fractions. The urinary excretion of albumin was augmented during intravenous albumin therapy. Decreased plasma albumin in the nephrotic syndrome may be due to increased excretion, decreased production, or the combination of both. Increase in alpha 1 and beta globulin fractions may be explained by the increase in lipoproteins in nephrotic children usually associated with these fractions. It is conjectured that the low gamma globulin fractions might tie in with the greater susceptibility of infections of nephrotic children. 14 references. 2 tables. 5 figures.—*H. M. Goldstein.*

16. Metabolic and Systemic Disorders

Bone Lesions in Eosinophilic Granuloma, Hand-Schüller-Christian Disease, and Letterer-Siwe Disease. *Ignacio Ponseti, State University of Iowa Hospitals, Iowa City, Iowa. J. Bone & Joint Surg. 30-A: 811-33, Oct. 1948.*

Eight cases (6 in children) are described who illustrate the overlapping between eosinophilic granuloma, Hand-Schüller-Christian disease, and Letterer-Siwe disease. The clinical, roentgenographic and histologic characteristics of the bone lesions are believed to corroborate the modern trend of thought that these probably represent forms of the same pathologic process. Eosinophilic granuloma is typically a localized lesion of bone. The granulomatous lesions of the Hand-Schüller-Christian and Letterer-Siwe syndromes are widespread, and many organs are involved; bone lesions are frequent, but not always present. In solitary eosinophilic granuloma of bone, which is the mildest clinical form of this group of diseases, the local symptoms are tumor, tenderness and very slight pain. There are no general symptoms. Roentgenograms show a more or less clear-cut defect, well outlined by normal-appearing bone. There may be reactive periosteal new-bone formation or pathologic fracture. The prognosis is usually good and the lesion does not recur after its surgical removal or after roentgenotherapy. Malignant forms may occur which resist treatment and which can cause great bone destruction. Even in these instances, the general outlook for the patient is good. The granulomas may be single or multiple. Sometimes there occurs

slight persistent leukocytosis with eosinophilia. In two of the cases there were lesions of Hand-Schüller-Christian disease and multiple eosinophilic granulomata, side by side, with intermediary lesions between the two disorders. Two other cases were viewed as transitional forms between Hand-Schüller-Christian disease and Letterer-Siwe disease. Although solitary eosinophilic granulomata fall into a somewhat distinct clinical category, it is convenient to group multiple eosinophilic granulomata of bone with similar involvement of other organs under a common heading with Hand-Schüller-Christian disease and Letterer-Siwe disease.

The age at onset of symptoms is variable. They often begin during early childhood, usually in an insidious manner. Skin lesions, in the form of a generalized papular rash of minute lesions, or seborrheic dermatitis of the scalp, are frequent. Inflammation of the gingivae with hypertrophy and occasional ulceration of the gums is a common early symptom. Roentgenograms of the maxilla may show small cystic areas of bone destruction adjacent to the alveoli. The mastoid may be tender and show roentgenographically a more or less extensive bony defect. Exophthalmos is sometimes seen. Moderate enlargement of several or all of the palpable lymph node groups is customary. The spleen and liver may be enlarged. Infiltration in both lung fields, with uniform distribution, is often seen in the roentgenograms. Diabetes insipidus may be an early symptom. The blood cholesterol and total lipids are within normal limits. Bone lesions are frequent. (The skull was involved in 7 of these 8 patients.) Any bone may be affected, even metacarpals and phalanges. The roentgenographic appearance of the bone lesions in Hand-Schüller-Christian disease and in Letterer-Siwe disease is usually identical with that of the lesions of solitary or multiple eosinophilic granulomata. The areas of bone destruction are usually sharply outlined and the surrounding bone normal. Markedly destructive lesions were seen in one patient. All of the bone lesions explored surgically were filled with granulomatous tissue made up of a great number of large mononuclear cells, probably histiocytes, and a small number of leukocytes. Except in the typical eosinophilic granuloma, eosinophils were not present and the cytoplasm of the histiocytes appeared to be finely or coarsely vacuolated. In other cases, the granulomatous tissue was made up of extensive sheets of foam cells. Surrounding structures were not infiltrated by the granulomatous tissue, even in the most malignant-appearing lesions. It seems that the lesions of eosinophilic granuloma can heal by resolution, or pass through a lipogranulomatous stage before healing.

The cause of this group of diseases is unknown. Attempts to find an infectious agent have failed. Hand-Schüller-Christian disease and Letterer-Siwe disease should probably not be included in the group of diseases caused by disturbed lipid metabolism. The natural course of these diseases is often not affected by treatment. As a general rule, the older the patient the more favorable the prognosis. The fatalities usually occur in children, after a more or less protracted course, but patients over ten years of age usually survive. Roentgenotherapy was given to the bone lesions in all of these patients, and relieved the local pain in every case after a few days. It was

difficult to evaluate the effect of the roentgen treatments on the development and final outcome of the bone lesions and on the disease as a whole. Nevertheless the author advises roentgenotherapy for all such cases. 7 references. 8 figures.

Galactosemia. *Eugene O. Goldstein, and Julius M. Ennis, Sinai Hospital, Baltimore, Md. J. Pediat. 33: 147-54, Aug. 1948.*

This is the description of a 2½ month old infant with galactosemia, the eighth authentic case to be reported. The patient had the features common to all the other cases—enlarged liver and spleen, failure to gain weight and develop properly, melituria, and albuminuria. Cataracts were also present, a lesion described in 50% of the other cases. The reducing substance responsible for the melituria was identified as galactose. By the removal of lactose from the diet, all the pathologic signs and symptoms subsided except for the enlarged liver. The patient had a normal glucose tolerance curve, a high galactose tolerance curve, and exhibited antagonistic metabolic effects of glucose and galactose upon one another. The theories of the mechanism of galactosemia are reviewed. 7 references. 6 figures.

Hypophosphatasia. A New Developmental Anomaly. *J. C. Rathbun, Hospital for Sick Children and the University of Toronto, Toronto, Canada. Am. J. Dis. Child. 75: 822-31, June 1948.*

An infant with unusual osseous anomalies who exhibited grossly irregular cartilage maturation and lack of calcification is described. The vault of the skull was almost devoid of calcium. The symptoms during life were repeated convulsions, malnutrition with loss of weight, and deformities of the wrists and bowing of the legs apparent at 2 months of age. The serum calcium level remained in the range 10.9 to 13.6 mg. per 100 cc. The serum phosphorus was between 4.4 and 6.9, with a terminal rise to 10.5 the day after 5 mg. of testosterone propionate were administered intramuscularly. The nonprotein nitrogen was 44.2 to 46.5 mg. per 100 cc. A calcium excretion test, while on regular feeding with an intake of 0.4 Gm. of calcium in twenty-four hours, showed an excretion of 0.0058 Gm. of calcium in the urine (normal 0.150 Gm.) and 0.0255 Gm. of phosphorus (normal 0.200 Gm.). Alkaline serum phosphatase estimations were made frequently, using the method of Lowry and Bessey. The results showed an absent or extremely low alkaline serum phosphatase activity, 0.0 to 0.7 units. (Normal range: adults 1.5 to 4 units; children 5 to 15 units.) There was no striking improvement after the administration of percomorph oil or thyroid therapy.

The autopsy showed multiple bone fractures, enlargement of the growing ends of the bones, many non-calcium casts in the kidneys, and a cellular structure of the bones resembling severe rickets. Samples of tissue were taken at the autopsy and extracted for phosphatase by a modification of the methods of Kay and Woodward. The amounts of this enzyme which could be extracted from intestine, lung, kidneys and bones were, in general, about 1/100th of comparable amounts extractable from tissues of normal subjects. There was also a lowered content of bone ash. It was concluded that this disease was not osteogenesis imperfecta, achondroplasia, or renal hyper-

parathyroidism. The low to absent alkaline phosphatase appeared to be the primary defect responsible for the clinical picture, and it was therefore decided to call this disease "hypophosphatasia". 19 references. 4 tables. 5 figures.

17. Milk; Infant and Child Feeding

See Contents for Related Articles

18. Miscellaneous

An Unfamiliar Mechanism of Disease Transmission. *Richard E. Shope, Rockefeller Institute for Medical Research, Princeton, N. J.* Proc. Am. Philosoph. Soc. 92: 289-93, Oct. 1948.

Three animal diseases are described in which the causative agents are transmitted by helminths (worms). Blackhead of turkeys is caused by the protozoan parasite, *Histomonas meleagridis*. These protozoa are carried within the eggs of the common cecal worm, *Heterakis gallinae*, and persist in the eggs during embryonation. When the embryonated ova hatch in the alimentary tracts of the turkeys, the young worm larvae penetrate the epithelium of the cecal glands. They carry their histomonads with them and deposit them in a site favorable for their establishment in causing blackhead. The worm thus not only serves as the intermediate host for *Histomonas meleagridis* but also provides it with a portal of entry by damaging tissues and preparing them for parasitization by protozoan.

Salmon poisoning of dogs is the second disease in which a worm was demonstrated to serve as intermediate host. This is an acute, highly fatal disease of dogs and other Canidae. The cause of salmon poisoning is an infectious agent carried by an intestinal fluke whose other hosts are snails and salmon, or trout. The exact nature of this infectious agent still remains unknown. It has some of the properties of a virus but lacks other prerequisites of this class of agents.

The third worm-related disease is swine influenza. This is an acute, highly contagious respiratory disease of swine caused jointly by the bacterium *Hemophilus influenzae suis* and the swine influenza virus. There is evidence to indicate that swine acquired their infection from man for the first time during the great 1918 influenza pandemic. Once an epizootic has started, no intermediate host need be invoked to account for its spread. It is, however, periodic in its occurrences. During about three-quarters of each year it is apparently completely absent from our swine population. An intermediate host capable of preserving swine influenza virus from one epizootic to the next has been found—the common swine lungworm. This is a nematode parasitic in the bronchioles of swine. The fully embryonated eggs are coughed up from the bronchi and swallowed, to reach the outer world in the feces. Further development depends upon their being ingested by an earthworm. Once within the earthworm, the lungworm eggs hatch and the larvae develop to the third or infective stage, where they persist until the earthworm is eaten by the pig. The entire cycle may take from a month to several years for its completion. It has been found that the larvae developing from lungworm ova laid during the time the host pig is undergoing an attack of swine influenza are carriers of swine influenza virus. This is also true for ova

laid within a short period after recovery. Curiously, however, the virus cannot be detected by direct means either in the larvae in the earthworm or in the adult lungworms after transmission to the pig. It appears to be present in an occult or masked form. Evidence of its presence is furnished only by its subsequent behavior under very specialized conditions in the swine respiratory tract. Swine infected with lungworms that are carriers of the masked virus do not as a rule come down directly with swine influenza. To bring them down with a severe or even fatal influenzal infection some stimulus of itself completely harmless, is needed. Several such provocative stimuli have been used experimentally. The one most regularly effective consists of multiple intramuscular injections of the bacterium, *H. influenzae suis*. In nature the provocative stimulus which invokes infection in such pigs seems to be related in some way to rapid and sudden changes in temperature, and exposure to raw, wet, inclement weather. Swine influenza virus can persist without giving any detectable evidence of its presence for at least as long as thirty-two months in the earthworm, and for at least an additional three months in association with adult lungworms in the swine respiratory tract. The suggestion is made that some day other diseases may be shown to be associated with helminths as intermediate hosts. Reference is made to the mystery which shrouds the epidemic virus diseases, such as measles, mumps, chicken pox, and poliomyelitis, which appear periodically in epidemic form and then apparently disappear. 16 references.

(The suggestion in this last paragraph merits careful thought.—ED.)

19. Musculoskeletal System

Infantile Cortical Hyperostoses. *Katherine T. Chen and Ting-Sing Yu, Chun San Memorial Hospital, Shanghai, China. Chinese M. J. 66: 266-67, May 1948.*

A first case of infantile cortical hyperostoses was observed and reported in China, adding one to less than a dozen such cases in the literature since Caffey's report in 1939. The patient was a male breast-fed infant, 7 months old, who began in the sixth week to hold his left leg in flexion; any attempt to move it caused him to cry. Over the tibia and below the knee there was a deep-seated soft swelling which was disclosed by x-ray to be subperiosteal thickening of the left tibia. Similar lesions also appeared in the right femur and tibia. Other clinical and laboratory findings were essentially normal. Ten days later the second x-ray showed marked changes involving all the long bones of the upper extremities. "Four weeks later x-ray examination revealed: 1) thickening in the long bones of the upper extremities had nearly disappeared, while that in the right femur appeared more marked than before; 2) thickening in the left tibia was more marked in its lower portion." At the age of 6 months the infant developed a swelling in his right face, which showed roentgenographically similar changes in the mandible. The swelling lasted about 5 months and disappeared spontaneously. The infant was well when last seen at the age of 18 months. 4 references.

(The disease has been recognized in both American hemispheres and in Europe. This is the first instance reported from China.—ED.)

20. Nervous System

See Contents for Related Articles

21. Newborn Period, Prematurity

A Study of Neonatal Infections in the Nurseries of a Maternity Hospital.
Muriel J. L. Frazer, Jubilee Maternity Hospital, Belfast, Ireland. Arch. Dis. Child. 23: 107-13, June 1948.

During a period of fourteen months (Jan. 1, 1946, to Feb. 28, 1947) all infections, however trivial, were investigated to determine their nature and the factors influencing their spread. There were 63 instances among 2,274 infants, giving a rate of 2.77%. Fifty-three (84.1%) of all infections were due to staphylococcus aureus. Of these, skin lesions numbered 36. There were 8 cases of thrush due to *Monilia albicans*, the total incidence for all infants being 0.35%. There was no gastroenteritis; there were 4 instances of styes and 1 instance each of dacryocystitis, rhinitis, umbilical sepsis, septicemia, coryza and pneumonia. Only 2 deaths were attributable wholly or in part to these cross-infections.

The various factors contributing to the prevalence of cross-infection were studied. Every person who had come into contact with an infected infant was examined and had nasal and throat swabs taken for culture. It was assumed that any staphylococcus aureus giving a positive coagulase reaction was significant. In ten cases pathogenic staphylococci were recovered from the mother, who in 9 cases had skin lesions on face or arms which antedated the baby's lesions. In the tenth case, the mother had puerperal pyrexia due to staphylococci, and the baby developed staphylococcus septicemia beginning on the fourth day of life. In none of these 10 cases was staphylococcus aureus isolated from any member of the staff who had been in contact with mother and child. In 13 cases nurses appeared to be possible sources of infection. Five babies were presumed to have acquired their infection before birth, since a pustular rash from which pathogenic staphylococci were isolated was present at delivery. Trauma was believed responsible for 4 cases of thrush. A batch of nipples made of harsh red rubber had been issued, and every baby fed with these developed an abrasion on the hard palate. The cross-infection rate was highest where babies were kept beside their mothers whether in six-bed units or small side wards. Segregating the babies behind an incomplete partition lowered the infection rate still further, but the steepest fall occurred where nurseries were entirely separate from the lying-in wards. The only essential difference in this unit was that the hazard of dust-borne infection, due to bed-making and sweeping, was eliminated. In all other respects the nursery routine was identical with that in other parts of the hospital. "This separation is psychologically undesirable, but it certainly gives the best results as regards cross-infection." The small separate nursery would seem to be the most satisfactory from this point of view. The reason for recommending small rather than large newborn nurseries is to safeguard against widespread infection should epidemic diarrhea break out in the nursery unit. 11 references. 4 tables. 4 figures.

(The prevention and control of infections is still the main worry and the chief problem in nurseries for the newborn. Since more and more babies are being born in hospitals, the problem is constantly increasing. Due to rising hospital deficits and the chronic shortage of nurses now, small nursery units are increasingly difficult to build or maintain. As noted in the above abstract, "rooming-in" arrangements furnish only a partial answer. A fresh approach is needed which will assure the mother and infant of all the obstetric advantages of hospital delivery and at the same time protect the infant from neonatal infections. By the third or fourth post-partum day, it is usually apparent whether or not the mother or infant is likely to have any difficulties requiring further hospitalization. If no such problems are expected, the mother and infant could be sent home at that time provided the home itself is free of infection. They must go to the home some time, and going a few days earlier than usual will add little or no hazard. If necessary, a scheme for regular home visits by a nurse and even a hospital resident could be arranged for patients unable to afford private care. The expense would be less than that of longer hospitalization.)

Meanwhile the problem of infections is changing due to the efficacy of modern therapy. The gonococcus, once a major scourge, is now an infrequent cause of trouble and the other common cocci are usually controllable. However the newborn's poor capacity for combatting coccal infections must still be taken into account. To be safe, penicillin should be given in large doses without respect to body weight when an infection is suspected. Also it is easy to forget that many penicillin-resistant organisms may cause fatal infections in the newborn, especially the colon group of gram-negative bacilli and the not-uncommonly encountered strains of resistant staphylococci. When neonatal infection is to be feared particularly, as after contaminated deliveries or when the membranes have been ruptured for a long time before delivery, penicillin should be given prophylactically in full dosage and also sulfonamides or streptomycin. Such prophylaxis can probably be simplified by the use of aureomycin or chloromycetin alone, but injectable agents are often necessary in the immediate neonatal period. Epidemic diarrhea is now the greatest mass threat to newborn nurseries. Prevention requires rigid year-round isolation care, but even so epidemics do develop. Fortunately newborn infants usually have fairly good resistance to the common respiratory viruses. Monilia is ever-present, probably most often on the mother's skin. As noted in the above abstract, anything which injures the infant's delicate oral mucosa will increase the likelihood of thrush. Miliaria, so difficult to prevent during the hot humid weather, carries a constant threat of superimposed coccal infection. The umbilical stump, as always, provides an open channel for development of sepsis (or even tetanus). Prophylactic therapy is justifiable in the presence of even mild infection. Finally, anyone with gastro-intestinal, respiratory or skin infections, however mild, should stay away from the nursery. "Precautions" are not enough.—ED.)

Factors Influencing the Blood Picture of the Newborn. Studies on Sinus Blood on the First and Third Days. *Q. B. De Marsh, Seattle, H. L. Alt, Chicago, and W. F. Windle, Philadelphia.* *Am. J. Dis. Child.* 75: 860-71, June 1948.

Comparison of the blood picture in samples obtained by puncture of the superior sagittal sinus and puncture of the heel in newborn infants reveals that hemoglobin values and number of red blood corpuscles are significantly higher when the blood is obtained from the peripheral capillaries. A representative set of data are the mean figures for 9 infants on whom blood specimens were collected from both the heel and the sinus on the third day. The mean values for the sinus blood were 17.8 Gm. of hemoglobin per 100 cc., 4,970,000 erythrocytes per c. mm. and 51% hematocrit. The corresponding mean values for the heel blood were 20.5 Gm. 5,610,000, and 57%, respectively. Other factors which influence the blood picture of the newborn are the time of clamping the umbilical cord in relation to delivery, and the time after birth at which the blood sample is obtained. The reticulocyte counts remained high (5.9%) on the third day of life in the group whose umbilical cords had been clamped immediately at birth, though they had declined (2.7%) on the third day in the group whose umbilical cords were not clamped until the placenta had separated. Deprivation of the newborn of its complement of placental blood appears to lead to prolongation of increased erythropoiesis. Truly significant differences in the icterus index between the group whose cords were clamped early and the group whose cords were clamped late were not obtained. 5 references. 3 tables.

Plasma Protein Studies on Normal Newborn and Premature Infants. I. Plasma Protein Values for Normal Full Term and Normal Premature Infants. II. Use of Concentrated Normal Human Serum Albumin in Treatment of Premature Infants. *Lucy-Gale McMurray, Pasadena, Calif., Joseph H. Roe and Lewis K. Sweet, Gallinger Municipal Hospital and George Washington University Medical School, Washington, D. C.* *Am. J. Dis. Child.* 75: 265-78, March 1948.

Determinations were made of the albumin, globulin, and total protein content of the plasma of 37 newborn premature infants and 46 full term newborn infants. No significant correlation was found between the values obtained and the birth weights, but in general the values were higher in the mature infants. The mean readings may be tabulated as follows (in Gm. per 100 cc.):

	ALBUMIN		GLOBULIN		TOTAL PROTEIN	
	MEAN	S.D.	MEAN	S.D.		S.D.
Premature (3 lb. 8 oz. to 5 lb. 7 oz.)	4.3	0.60	1.60	0.37	5.6	0.47
Mature (5 lb. 8 oz. to 8 lb. 7 oz.)	4.8	0.47	1.75	0.49	6.4	0.60

Serial weekly determinations of plasma proteins in 17 of the premature infants showed erratic wide fluctuations in the albumin and total protein values. There was no significant increase with increasing age or development in infants fed an evaporated milk-carbohydrate formula supplying 60 calories per pound body weight (130 per Kg.) and 2.2 Gm. of protein per pound (4.8 Gm. per Kg.). Sixteen other premature infants were given concentrated human serum albumin intravenously, in doses of 2 or 3 cc. of 25% solution per pound body weight (4.5 to 6.7 cc. per Kg.) two or three times a week. There were no adverse reactions. These infants developed a steadily increasing albumin and total protein content of the plasma, with an initial decrease and subsequently lower values for plasma globulin. These infants gained weight more rapidly, had fewer illnesses, and were discharged in a shorter time than the 17 controls. At 3 and 5 months of age they still had a weight advantage over the controls.

The impression was gained that the use of concentrated human albumin might be advantageous in the care and treatment of premature infants, though further study is needed to establish this. A dosage of 3 cc. per pound (6.7 per Kg.) of 25% solution twice a week seemed to give optimal results and is suggested as a starting point for further observations. 6 references. 3 tables. 6 charts.

(This statistical analysis of the protein levels in premature infants is the best available. One is always cautious in accepting differences in results in premature infants because of the great variability of individual premature infants and the differences in mortality that may be produced by small variations in care that cannot be avoided in a study of this type. There is no doubt that the authors succeeded in raising the concentration of serum albumin by injecting relatively small amounts of purified albumin. The data would be more impressive, even in such a small series, if treated infants and controls had been selected with greater care, paired as to birth weight, sex and other variables. For example, it appears that the only 2 infants weighing less than 3.7 pounds at birth happened to be in the untreated group.—ED.)

22. Nutrition

See Contents for Related Articles

23. Parasitic Diseases

The First Two Cases of Transfusion Kala-Azar. Huei-Lan Chung, Hua-K'ng Chow and Jui-Ping Lu, Chung Ho Hospital, Peiping, China. Chinese M. J. 66: 325-26, June 1948.

For prophylaxis of measles, 2 girls, aged 6 and 4 years, each received intramuscularly 20 cc. of their mother's blood. A few days later the mother developed irregular fever and chills which soon proved to be kala-azar. With this history, both children were immediately placed under close observation. About nine months after the prophylactic injection the older child developed a fever and two weeks later her spleen and liver were found to be 4 cm. and

2 cm. respectively below the costal margin. The globulin test was weakly positive. Leishman-Donovan bodies were easily found in smears from the sternal puncture. A total of 1.55 Gm. of neostibosan given intravenously in a period of five weeks eradicated the kala-azar infection. Ten months after the blood injection, a regular check-up examination of the younger child revealed general glandular swelling and enlargement of both spleen and liver. The leukocyte count was 6,000 and hemoglobin 10.5 Gm. Globulin test and sternal puncture were negative. One month later the globulin test was positive and parasites were found in the sternal bone marrow. The next day, the child developed fever and anorexia. Complete recovery followed a course of neostibosan amounting to 1.48 Gm. given intravenously over a period of 34 days. It is believed that those 2 cases represent instances of transfusion kala-azar. The relatively long incubation periods were thought to be due to the small number of the parasites injected. 10 references.—C. L. Kao.

Toxoplasmic Encephalomyelitis. A Clinical Report of Six Cases. *Gabriel A. Schwarz, Elizabeth Kirk Rose and Wilfred E. Fry, University of Pennsylvania, Philadelphia, Pa. Pediatrics 1: 478-94, April 1948.*

The chief clinical features of the infantile form of toxoplasmosis are: 1) onset at birth or soon after; 2) convulsions; 3) bilateral communicating hydrocephalus; 4) bilateral focal chorioretinitis usually involving both maculas; 5) multiple calcifications in the brain. Six cases of toxoplasmic encephalomyelitis in infants and children are presented. In each the initial diagnosis was made on clinical grounds alone. All of the patients are still living. The ocular findings were the most constantly occurring of all the features, with impairment of vision and focal chorioretinitis present in all; ocular nystagmus and optic atrophy in 5 cases; mental retardation in 6; cerebral calcification in 5. Serum neutralization tests were done on 5 of the patients; four proved positive and one was unsatisfactory. Convulsions and muscle twitches or tremors were present in 3 cases. No means of prevention or therapy has yet been found, though recent experiments with sulfapyridine show some promise. 39 references. 2 tables. 5 figures.

(Torulosis has produced somewhat similar disturbances. See next abstract.—ED.)

The Roentgen Changes Produced by Diffuse Torulosis in the Newborn. *Ed. B. D. Neuhauser and Arthur Tucker, Infants' and Children's Hospital, Boston, Mass. Am. J. Roentgenol. 59: 805-15, June 1948.*

Three fatal cases with diffuse infection of the yeast *Cryptococcus neoformans* are presented. Each patient had a mild hydrocephalus on x-ray study and diffuse punctate and confluent calcification of a severely degenerated brain. The calcification strikingly resembles that seen with toxoplasmic encephalitis. Enlargement of the spleen was marked in each patient and each had an enlarged liver. Two patients showed inflammatory and granulomatous lesions in the lungs. Two also showed a non-specific submetaphyseal

decalcification of the long bones. The signs and symptoms were so varied that a clinical diagnosis does not seem possible from the history alone. Physical examination revealed chorioretinitis in 2, lesions of the central nervous system in 2, jaundice in one and fever in none.

It is interesting although not necessarily significant that these three male children were of Italian parentage. Each was born prematurely without definite illness of the mothers during pregnancy. The infection in each patient was evidently acquired in utero, during delivery, or very early in the neonatal period. The damage produced by the fungus was severe, and in these 3 patients was fatal within a few weeks after birth. Although it is probably not possible to make an accurate roentgen diagnosis of torulosis in the newborn, the demonstration of an enlarged calvarium, hydrocephalus, loss of cerebral substance and brain degeneration as evidenced by intracranial diffuse punctuate and confluent calcification in association with inflammatory or granulomatous lesions in the lungs and an enlarged liver and spleen should suggest the diagnosis. 20 references. 18 figures.—*Author's abstract.*

24. Pathology, Anatomy, Bacteriology

See Contents for Related Articles

25. Physiology, Biochemistry

The Biochemistry of the Metabolic Fecal Protein Nitrogen. *Anthony A. Albanese, Virginia I. Davis, Marilyn Lein and Emilie M. Smetak, New York University College of Medicine, and Bellevue Hospital, New York, N. Y. J. Biol. Chem. 176: 1189-98, Dec. 1948.*

In infants fed experimental diets it has been found that an average of 22.4% of the fecal N arises from the presence of a protein in the stools. This protein (proposed name, fecanin) failed to reflect in its amino acid composition and other properties any dietary changes imposed on the organism from which it was derived. It was excreted even when protein hydrolysates were substituted for the protein moiety of the diet. This nitrogen lost in the feces in the form of fecal protein constitutes a loss of anabolic N. The loss constitutes an average of only 11.9% of the retained N, but the high content of essential amino acids greatly augments its significance, particularly when poor quality or deficient diets are fed. 29 references. 5 tables.

(The constancy of the amino acid composition of the substance isoelectrically precipitated at pH 6.0 ± 1 from extracts of stools, regardless of the subject's diet, justifies the conclusion that "fecanin" is a definite protein. The further conclusion that it is an endogenous excretory product and not a bacterial product could be strengthened by more detailed examination of proteins derived from cultures of various intestinal organisms.—ED.)

Intestinal Absorption of Vitamin A from Aqueous and Oily Menstruum. *Hans Popper and Bruno W. Volk, Hektoen Institute for Medical Research, Cook County Hospital and Northwestern University Medical School, Chicago, Ill. Proc. Soc. Exp. Biol. & Med. 68: 562-64, 1948.*

Observation of the vitamin A fluorescence in the intestine of rats showed that greater amounts of vitamin A — approximately three times as much — were absorbed if the latter was administered in an aqueous instead of an oily menstruum. In addition, vitamin A in water penetrated the intestinal wall faster; the peak of absorption occurred at a higher level of the intestine and vitamin A remained longer in the villi.

(Another argument for administering vitamin A in aqueous dispersion to children with subnormal fat absorption.—ED.).

26. Psychology, Psychiatry

See Contents for Related Articles

27. Public Health, Epidemiology

Births Remain High in 1948. *News Release, National Office Of Vital Statistics, Washington, D. C. March 3, 1949.*

The second largest number of births in the history of this country occurred during 1948. The total number of births (registered and unregistered combined) was estimated at 3,715,000 for 1948 and 3,876,000 for 1947. Only eight years earlier in 1940, the last pre-war year, the figure was little more than 2½ million (2,558,000). The 1948 estimated birth rate is 24.4 per 1,000 population. This is about 5% below the final rate of 25.8 for 1947, but exceeds the 1946 rate (23.3) by almost 5%. (These rates are based on registered births).

28. Respiratory System

Irradiation of Lymphoid Tissue in Diseases of the Upper Respiratory Tract. *Donald F. Proctor, Leroy M. Polvogt and Samuel J. Crowe, Johns Hopkins Hospital, Baltimore, Md. Bull. Johns Hopkins Hosp. 83: 383-428, Nov. 1948.*

In discussing irradiation of hyperplastic lymphoid tissue in the nasopharynx during the past 24 years, the authors review the results of treatment of some of the common otolaryngologic problems. Since lymphoid tissue commonly regenerates following adenoidectomy, and since the regenerated tissue contains crypts similar to normal adenoids, treatment has been aimed at making local conditions in the nasopharynx unfavorable for infection. Obliterating the crypts by irradiation seems to bear out the clinical observation that these crypts serve as a portal of entry, for there is a marked decrease in the number and severity of colds following a course of irradiation treatment of the nasopharynx. Often irradiation alone was used but frequently the combination of surgical removal supplemented with antibiotics and irradiation was necessary to obtain the best results. Irradiation should be of the right amount and at proper intervals to shrink lymphoid tissue in the naso-

pharynx without producing undesirable effects, such as dryness and crusting, and patients should be examined at least once a year for several years to keep the upper air passages in good condition. Various applicators have been used since 1924; the present one is a 0.3 mm. monel metal 50 mg. radium sulphate applicator with a radioactive length of 15 mm. The technic of treatment is given in detail and illustrated. It is believed to be entirely safe if rules are strictly followed, and no complications attributable to the radium treatment have been observed. There is careful selection of cases; adenoids are not irradiated unless there are symptoms thought to be attributable to them, nor are patients irradiated for symptoms unless evidence of infected adenoid tissue is present.

In the outpatient department at Johns Hopkins Hospital, irradiation of the nasopharynx has been used on as many as 50 to 75 cases a week for the past ten years. Results are not given in detail but are believed to be superior to other methods of treatment without irradiation. One of the authors (L.M.P.) reviewed over 800 patients seen in his private practice who had received irradiation in their treatment and who had been followed at least two and one-half years. The results were uniformly good, especially in those treated for impaired hearing thought to be due to obstructed eustachian tubes. In the Hagerstown consultation clinic 400 patients, mostly children, have been treated with radium for hearing impairment, recurrent respiratory or ear infections, or bronchial asthma. The amount of adenoid tissue in the nasopharynx decreased markedly after treatment, the degree of interference with the eustachian orifices was greatly lessened, and nearly half the group with impaired hearing showed improvement. Irradiation proved a helpful auxiliary in the treatment of bronchial asthma. There were 41 children so treated in whom the average follow-up was nearly three years. Of this group, 13 were well when last seen, 21 were definitely improved, and 7 showed no improvement. Of the patients seen because of hearing impairment, 83% had otitis or upper respiratory infections thought to be responsible for the loss of hearing. A comparison was made between the hearing in the better ear when first seen and when last seen after irradiation treatment. Only 28.6% had normal hearing when first seen but 63% had normal hearing at the last examination. 48 references, 22 figures.—M. Maresh.

(Irradiation of the nasopharynx for lymphoid tissue hyperplasia is currently receiving much attention. Radium is being widely employed; however, x-ray is also being used. Not all otolaryngologists are prepared to go as far as Dr. Crowe and his associates, because of the impression that satisfactory shrinkage can be obtained only when the masses of lymph tissue are small in individual size. A year or more will probably be required to compile enough careful reports so that a clear picture can be drawn of just how much benefit will be obtained by irradiation. Radiation appears to offer most promise when regeneration of lymphoid tissue is a prominent sequel of tonsil-adenoidectomy. Caution must be added that all users of radium applicators may not be as careful and critical as the investigators whose work is

here summarized. We have seen dry crusted nasopharynges (*pharyngitis sicca*) following irradiation therapy. This is a real entity. The ultimate effects of the therapy on some of the patients remains for the future.—ED.).

Acute Idiopathic Pulmonary Hemosiderosis. *Leslie Nancekievill, Sheffield Royal Hospital, England. Brit. M. J. 1, 431. March 12, 1949.*

A 2½ year old child is described who developed anemia over a period of one month. The anemia responded dramatically to transfusion, only to be followed in five days by a relapse suggestive of an acute hemolytic process. A chest x-ray showed diffuse reticulation throughout the lung fields, most pronounced near the hilar regions. After a second transfusion, x-ray showed increased mottling of the lung fields spreading from the hilar regions. The respiratory rate began to rise, and signs of respiratory difficulty materialized. In spite of adequate general therapeutic measures, the child died. Necropsy showed anoxic cardiac failure as the cause of death, secondary to the lung changes. The lungs and pleurae showed multiple subpleural petechial hemorrhages, a small effusion, and recent pleural roughness. The pleura was deep purple in color, and the cut surface of the lung was brown, solid and airless except for one small segment. Microscopically the alveoli were crammed with phagocytic iron-containing cells giving a Prussian-blue reaction, and there was considerable recent intra-alveolar hemorrhage. There was a possible slight increase in interstitial fibrous tissue in places, but no deficiency of fragmentation of elastic tissue. No free iron was present in sections of spleen, liver, lymph nodes or reticulo-endothelial tissues.

The radiologic changes resembled miliary tuberculosis, sarcoidosis, or those which follow lipoidol instillation, but the density of the reticulation was maximal near the hilar regions and diminished toward the periphery, resembling passive hyperemia. There was a disparity between the degree of radiologic change in the lung fields and the minimal clinical signs during the early phase of the disease. Examination of the blood showed no hemolysins. With no other evidence of generalized distribution of hemoglobin breakdown products in the reticulo-endothelial system at necropsy, hemolytic disease seemed to be ruled out as the cause of the process. This, plus the absence of significant defects in the lung structure leaves the pathogenesis of the disease a complete mystery. 4 references. 3 plates.—*H. E. Butson.*

29. Skin, Teeth, Hair

See Also Introductory Special Section

Dermatologic Problem of the Adolescent. *Lester Hollander, Pittsburgh, Pa. Am. Pract. 3: 290-96. Jan. 1949.*

This is a discussion of the treatment of acne, here presented as a disease of the pilosebaceous apparatus. A comedone or blackhead is an inspissated, waxy plug of accumulated sebaceous material, with its outer end blackened by oxidation. It is not caused by discoloration with soot, dirt or soil, or by inadequate washing. Milia are waxy conglomerations of blocked sebaceous material derived from sebaceous and pilosebaceous glands devoid of an

excretory duct. Papules and pustules are manifestations of nonsuppurative or suppurative folliculitis accompanied by necrosis. The end result of these postules is scarring, which often is permanent. Blockage of the sebaceous material helps to make the skin dry, parched and inflexible. The scalp presents associated disturbances. The excess of sebaceous exudate makes the hair shaft greasy, stringy and frequently malodorous. The scalp tends to become dry, with an overaccumulation of exfoliated epithelium or dandruff.

Acne surgery is the most important single procedure in treatment. A water miscible liquid cream is applied to the patient's face, massaged gently into the skin and wiped off thoroughly with a cotton towel. The face is then washed thoroughly with a liquid soap and again dried. With the aid of magnifying loops and a sharply focused light the physician expresses as many comedones as feasible while following the direction of the excretory tubule. When resistance to expression is experienced, the follicular opening of the comedone is obtusely incised without causing bleeding and the comedone expressed, using a comedone extractor or towel guarded finger tips. Any particle left behind may give rise to pustular folliculitis. Pustules are incised with an alcohol-dipped, von Graefe iris knife and emptied by spreading apart with cloth-guarded finger tips. The face is then washed with liquid soap and water, bleeding is checked with pulverized alum, and a sulfur-containing cream is gently patted onto the skin. This procedure is repeated once a week for three to four weeks, then less often.

Roentgen irradiation may abate the activity of the pilosebaceous glands. Seventy-five r or its equivalent $\frac{1}{4}$ U., superficial, unfiltered dose once a week for three to four weeks, then every two to three to four weeks, are given, not to exceed a total of 12 treatments. The patient must be informed of the full amount of treatment so that no damage from overdose may result. At home the patient must cleanse his skin 3 times a day. Each cleansing consists of 4 steps: 1) application of a soft, water soluble, emulsion type of skin oil or cream; 2) thorough wiping; 3) soap and water washing; 4) thorough washing. On retiring, a sulfur-containing cream or lotion is applied or patted onto the skin. Girls may use a nonfat-containing powder and lipstick, but no occlusive make up, powder or cake rouge. Penicillin may be given. For cold abscesses, autogenous vaccines are of value. Cream, ice cream, cheese, chocolate and nuts are eliminated from the diet, and the intake of milk limited to one pint a day. Vitamin A may occasionally be of value. Removal of comedones and pustules should not be carried out by the patient; severe damage may result. It is good to forbid the use of a looking glass by the patient. For treatment of acne scars, several procedures are of value in producing a rapid loss of the horny layer. These are: 1) CO_2 sulfur slush, 2) Cold quartz radiation to produce exfoliation of the epidermis, 3) chemical peeling. 13 figures.—*R. E. Cooke.*

Some Considerations in the Treatment of Hemangioma in Infants and Young Children. *Eugene P. Pendergrass, James C. Katterjohn, and James B. Butchart, Hospital of the University of Pennsylvania, Philadelphia, Pa. Am. J. Roentgenol. 60: 182-92, Aug. 1948.*

Irradiation is recommended as the treatment of choice for hemangioma of the skin or mucous membrane and the authors emphasize that treatment should be started in the first few weeks of life. Since 1938 they have treated 560 hemangiomas in 406 patients with satisfactory results. The superficial or dermal elements are first controlled by contact roentgen therapy (usually a Chaoul unit) and later the deeper portions of the lesion are controlled by implantation of radon seeds or the use of intermediate voltage therapy. Usually 3 to 7 treatments are required at intervals of four to six weeks and usually less than 1500 r is given. The medico-legal aspects, type of equipment, filtration, target-skin distance and dosage are discussed in detail. In spite of the fact that some hemangiomas disappear spontaneously, the authors still recommend irradiation as soon as the lesion appears because: 1) it can be administered without harmful effects; 2) small doses enhance the natural tendency of the lesion to disappear; 3) the results are excellent and superior to other observed methods. Over the past 20 years, they have observed no unsatisfactory result that can be attributed to irradiation. 13 references. 12 figures. 1 chart.—*M. Maresh.*

(Radiation, surgery, injection of sclerosing solutions, local application of carbon dioxide ice, and inactivity in the hope of spontaneous disappearance, have all been used in the treatment of hemangiomas. Each method is suitable for particular lesions, depending on the site, extent, nature and duration of the blemish, and the degree of cosmetic perfection which is desired in the end result. Many lesions often disappear satisfactorily without treatment. Yet, as the authors point out, hemangiomas in general are most responsive to therapy in the newborn period or very soon afterward. Radiation is the most generally applicable method of therapy for all sites, but is the least available and most expensive. It also requires the highest skill to avoid harm. No evidence has been presented that the amount of "contact" radiation used by the authors has any ill effects. If such evidence exists, it should be reported promptly. For lesions on the scalp, the depilatory effect of radiation is a drawback. Carbon dioxide ice is readily available and will give satisfactory results with superficial capillary hemangiomas or "strawberry nevi". No satisfactory method of therapy has been devised for the "port wine stain", or *nerus flammeus* type of lesion, unless it may be with *Grentz* rays. This method requires further study of treated cases and controls. It is understandable, therefore, that dermatologists differ considerably among themselves as to the best time and means for treating hemangiomas in infants. One reason for the difference in opinion may be that the pediatricians often give hemangiomas some months to heal by themselves, which often happens, and only refer the progressive or stationary ones to dermatologists or radiologists. These consultants consequently see the more stubborn and refractory lesions. Radiation and roentgen therapy during infancy are feared by many

because of possible harmful effects. Radiodermatitides have often followed the so-called "cautious use of radium and x-rays". Even solid carbon dioxide, though widely used, can be followed by scarring and contractures in certain body areas such as the palm of the hand and palmar surface of the fingers. In these sites, watchful waiting is often wisest, with perhaps the use of mild physical devices such as pressure with a half dollar for a period of many months, which sometimes works satisfactorily. The risk in waiting is that these tumors, if they do not recede, become less and less radiosensitive and more difficult to treat. When allowed to remain with the hope that spontaneous disappearance will occur, they sometimes undergo ulceration and destruction, leaving a much uglier scar than would follow any of the various modalities of treatment usually carried out by dermatologists. One of the most experienced pediatricians we know adopts a conservative waiting course when the hemangioma is on a part of the body which will ordinarily be covered by clothing, but refers the patient for active dermatologic therapy when the lesion is on an exposed part where cosmetic appearance is important.—ED.).

30. Social, Economic, and Organizational Problems

See Contents for Related Articles

31. Surgery, Anesthesia

Indications for Removal of Nontoxic Nodular Goiters. *George Crile, Jr. and W. S. Dempsey, Cleveland Clinic, Cleveland, Ohio. J. A. M. A. 139: 1247-51, Apr. 30, 1949.*

An enlarging adenoma of the thyroid which is firm and of different consistency from the rest of the gland, or one which is giving pressure sensations denoting growth, should be suspected of being a malignancy. This is especially true in childhood, at which age period every solitary adenoma should be viewed with suspicion. Small soft nodular enlargements which are believed to be innocuous by a physician thoroughly familiar with diseases of the thyroid may be disregarded. It is urged that the decision relative to removal of a tumor of the thyroid should be made by a physician or surgeon particularly qualified by experience and training. Carcinoma of the thyroid appears before the age of 20 in about one-fourth of the patients with papillary carcinoma. "A tumor of the thyroid in a child is more likely to be malignant than in a woman of 70". Most malignant tumors of the thyroid are hard, or at least firm, and usually are of a different consistency from the nontumorous thyroid. Some carcinomas of the thyroid enlarge very slowly, or may even remain stationary in size, but metastasize nevertheless. Many, if not most, carcinomas of the thyroid are carcinomas from the beginning and arise from the parenchyma of the thyroid as do benign adenomas. Treatment is surgical. Firm nodules in the thyroid must be viewed with a high index of suspicion. "The danger is not that a discrete adenoma may become malignant, but rather that it is already malignant". The operation should be so designed as to remove all of the tumor and cure the cancer if it is present. 6 references, 1 table.

(Some cancers of the thyroid grow slowly and may take years to cause death. Others proliferate rapidly and may prove fatal within a few months. Treatment with irradiation, while sometimes highly effective, cannot always be relied upon. Radioactive iodine has proved a valuable adjuvant in cases with metastases. Most experts agree that surgical removal should be the first procedure in cases recognized early, with block dissection of the regional lymph nodes if malignancy is demonstrable.—ED.)

Giant Ovarian Cyst in a Newborn Infant. *Lt. William I. Neikirk (MC) U.S.N.R. and Henry W. Hudson, Jr., United States Naval Hospital, Chelsea, Mass. New England J. Med. 239: 468-72, Sept. 23, 1948.*

This reports the successful removal of a large follicular cyst of the ovary from a 34 hour old infant. A review of the literature revealed only one other instance of successful operation in a newborn infant for a similar lesion. 4 references. 2 figures.

Acute Focal Edema of the Brain in Children with Head Injuries. *Wilfred Pickles, Rhode Island Hospital, Providence, R. I. New England J. Med. 240: 92-95, Jan. 20, 1949.*

Observations are described on 8 children who had signs and symptoms strongly suggesting extradural hemorrhage, but who made such rapid and complete recovery without operation that doubt was cast on this diagnosis. The ages of these 8 children varied from 10 months to 11 years. No similar cases have been seen in adults. Seven were boys. In most cases the child fell and struck his head on the floor or the ground. Linear fracture of the vault, without depression, was present in 3 cases, 1 with an additional fracture of the maxilla. There was initial unconsciousness in 3. The interval between injury and onset of focal signs varied from fifteen minutes to six hours. The focal signs included one-sided reflex changes indicating cortical involvement, Jacksonian convulsive movements or a combination of Jacksonian and generalized convulsions, and one-sided paralyses of varying degrees. Traumatic shock was present in only 2 children. Visible edema in the motor cortex area was found at operation on an eighth child. It is believed that this confirms the explanation previously made. It is the author's opinion that acute focal edema of the brain can occur in children with head injuries, and it should be regarded as a recognizable clinical entity. 10 references.

A New Method for Surgical Treatment of Large Omphaloceles. *Robert E. Gross, The Children's Hospital and the Harvard Medical School, Boston, Mass. Surgery 24: 277-92, Aug. 1948.*

Omphaloceles are congenital anomalies with a wide separation of the fasciae and muscles in the central part of the abdominal wall, and no cutaneous covering to the bulging peritoneum (amniotic membrane). Omphaloceles have such thin-walled sacs that they are likely to rupture in the first hours or days of life; abdominal evisceration is a grave or fatal complication. Omphaloceles should therefore be operated upon immediately

after birth. It is preferable to repair them in the first hours, before the swallowing of air or milk distends the gastrointestinal tract and increases the difficulties at the operating table. Omphaloceles vary from 2 to 15 cm. in diameter, and their capacity may be larger than the main abdominal cavity. The larger ones can contain most of the hollow viscera and even part of the liver. The umbilical cord arises from the apex or the inferior surface of the sac. From it the umbilical vein and the two umbilical arteries branch out over the surface of the sac to reach the margins of the abdominal wall above and below.

Omphaloceles result from developmental arrest of the abdominal cavity and wall during the third month of fetal life. At that early period the celomic cavity normally extends forward into the flared-out base of the umbilical cord, taking with it a large part of the intestinal tract. If the abdominal cavity does not grow fast enough, some viscera remain in the base of the umbilical cord and give rise to the defect in the abdominal wall. With small omphaloceles it is simple to excise the sac completely, replace the loops of intestine within the abdomen, and bring together the various layers of the abdominal wall to make a sturdy repair. With large omphaloceles the surgical problems are formidable and the fatality rates high. In a series of 60 babies treated for omphalocele at the Boston Children's Hospital, those with a sac less than 7 cm. in diameter had about a 75% chance of survival following surgery; those with a sac 7 to 9 cm. had a survival rate of about 30%; when the sacs were larger than 9 cm. the survivals were reduced to about 15%. A large portion of liver in the omphalocele makes the prognosis grave. With large omphaloceles it is always difficult to push the viscera back into the small abdominal cavity in order to complete the abdominal wall repair. The diaphragm may be pushed upward to induce uncontrollable respiratory distress. Pressure on the inferior vena cava may impede the return flow of blood from the lower abdomen and legs so that circulatory collapse and even death supervene, or compression of the stomach and intestines may give rise to temporary obstruction. To avoid the intra-abdominal crowding with large omphaloceles, a two-stage repair of the abdominal wall has already been proposed by Ladd and Gross. Only the skin and subcutaneous tissues are first brought together over the intestines. During the ensuing weeks the child's abdominal wall becomes stretched and it is then possible to undertake a secondary closure of the muscles and fasciae. This form of repair is extremely weak and carries the danger that the cutaneous suture line will not heal. Furthermore, the intestines are covered by a broad surface which is raw and to which they may become densely adherent. To obviate these drawbacks a new two-stage operation is proposed. The abdominal wall is repaired by a two-stage technic in which the first stage preserves the amniotic membrane and covers it with wide skin flaps, making no attempt to crowd the viscera back into the small abdominal cavity. The abdominal cavity is allowed to increase in size during the ensuing six to twelve months, at the end of which time the viscera can be replaced easily into the abdomen and the anterior abdominal wall can be

repaired completely by bringing together the various layers. Experiences with the method are summarized in notes from 3 cases in which it has been successfully employed. 10 references. 8 figures.

Congenital Macroglossia. *H. Glenn Bell and R. Gordon Millar, University of California Medical School, San Francisco, Calif. Surgery 24: 125-33, July 1948.*

The term macroglossia is applied to two distinct entities. One is a lymphangiomatous enlargement; the other, a true hypertrophy of the lingual muscle fibers. Biopsy and microscopic examinations are necessary to establish the diagnosis in either form. Two children are reported, one with muscular macroglossia, the other with lymphangiomatous macroglossia associated with cystic hygroma of the neck. True muscular macroglossia is a congenital hypertrophy of the muscle fibers of the tongue. It may or may not be associated with localized or generalized muscular hypertrophy elsewhere in the body, and is rarely found in the absence of other congenital abnormalities. It is usually associated with cretinism, mongolism, and idiocy. The gross pathologic picture may be of localized muscular hypertrophy, of unilateral enlargement, or of uniform muscular growth of the whole tongue. Microscopically there is a definite increase in the diameter of the muscle fibers. Surgery with partial removal has been the treatment of choice, though one case is on record of spontaneous resolution of true muscular macroglossia.

Lymphangioma is a far more common cause of macroglossia. A congenital rest which produces new lymphatics, the congenital absence of afferent lymph vessels, or nonpatent lymph vessels, perhaps due to obliteration by subacute infection with resultant obstruction and dilatation of the lymph spaces, have been suggested as causative mechanisms. Lymphangioma may manifest itself as a discrete nodule in the tongue or a diffuse enlargement of the whole organ. The protruding tongue usually becomes dry, fissured, and crusted. Infection results in fibrosis, further obstruction and progressive enlargement. Microscopically the muscle fibers are replaced by lacunae containing lymph. Vesicles on the surface are filled with blood from ruptured adjacent capillaries; the lymph spaces are enlarged and small hemangioma-like areas are produced. Lymphangiomatous macroglossia is frequently associated with lymphangioma of the neck, the so-called cystic hygroma. The tongue, the floor of the mouth, and the suprahyoid regions may all be involved. Surgery is indicated. A wedge-shaped incision is made, preferably by cautery, and the tongue reshaped as close to normal as possible. Postoperatively the maintenance of an adequate airway and the control of oral sepsis are prime considerations. A second resection is often necessary. Radiation therapy offers little help and has not proved as successful as with hemangiomatous lesions. Whatever success is attained is usually only temporary, and enlargement subsequently recurs. 10 references. 6 figures.

(The use of radon seeds implanted into the lymphangiomatous portion of the tongue has met with some success in infants, and might be given a trial when severe deformity of the tongue and adjacent structures is likely to follow radical surgery.—ED.).

32. Tumors

Extraocular Malignant Melanoblastoma. A Clinical Study. *Marion S. De Weese, University of Michigan Medical School, Ann Arbor, Mich. J. A. M. A. 138: 1026-29, Dec. 4, 1948.*

Of 93 patients with malignant melanoblastomas, 3 were in the prepubertal age group. These children were 1, 2 and 7 years of age. Their lesions resembled typical nevi and some clinical evidence of activity, as manifested by recent increase in size or tendency to bleed. All presented histologic characteristics indistinguishable from malignant melanoblastoma and had been diagnosed initially. All 3 are still living after intervals of two years and four months, six years and three months, and twelve years and ten months, respectively. None give evidence of metastases.

Malignant melanoblastomas usually arise in benign pigmented nevi or moles of the skin or meninges, or within the eye. Most persons have a variable number of nevi on their cutaneous surfaces, yet malignant melanoblastomas account for less than 1% of all malignant tumors. Nevi are now generally considered to be of neurogenic or ectodermal origin. They are closely related to other tumors of neurogenic origin, notably the neurofibromas. Two types of normal cells may contain the pigment "melanin", melanoblasts and melanophores. Only the melanoblasts are able to synthesize the pigment, and it is these or related nevus cells which undergo malignant transformation to melanoblastomas. Normal melanoblasts contain an intracellular oxidase, known as "dopa" oxidase, which can be demonstrated in the laboratory by the so-called "dopa reaction" of Bloch. Unfortunately their identification rests on histologic characteristics alone. This is often difficult, as they may closely resemble poorly differentiated neoplasms of other types. The tumors may metastasize either by the lymphatics or directly through the blood stream. The only hope at present for improving the survival rate of patients with malignant melanoblastomas lies in early radical surgical therapy. These tumors are radio-resistant. Prepubertal melanomas are effectively treated by simple excision. Prophylactic dissections of nodes are not indicated, but the child should be observed periodically as a precautionary measure. 9 references. 4 tables.

(The prepubertal melanoblastoma which proves its malignancy by metastasizing is rare indeed. See next abstract.—ED.)

Melanomas of Childhood. *Sophie Spitz, Memorial Hospital, New York, N. Y. Am. J. Path. 24: 591-609, No. 3, 1948.*

This is a study of 13 original cases of malignant melanoma in childhood, with a critical summary of the few others on record. Of the 13 children, 5 were boys and 8 girls, and their ages ranged from 18 months to 12 years. Ten of the lesions were under 1 cm. in diameter, the remainder being 1 to 3 cm. The majority of lesions were verrucous with irregular margins. All were elevated above the skin surface, and pink, red, brown or black in color. None had hair. In 6 cases the lesions had been present since birth; in the others they had been noted for from 6 weeks to 4 years. All had increased

gradually in size except for one which had had rapid growth for 6 weeks only. Five of the lesions occurred on the face, one on the trunk, 2 on the upper extremity, and 5 on the lower extremity; one of the latter occurred on the sole. Treatment consisted only of local surgical excision; in one case a group of obviously metastatic nodes was later removed from the groin.

All but one of the 13 children are alive and free from recurrence either locally or in drainage sites, after 3 to 13 years. Eight of these are at or have passed the age of puberty. The one fatality occurred in a female child, with no development of secondary sex characteristics, whose lesion was first noted on the sole of the foot at the age of 12 years. After rapid growth over six weeks, a soft white tumor, 2 cm. in diameter, was resected from the plantar fascia. One month later there was a bulky local recurrence, thrombosis of the femoral vein, and metastasis to inguinal lymph nodes. The child died of generalized metastases. Speaking in general, however, conservative surgery seems more justified for juvenile melanomas than for adult melanomas in view of the low frequency of metastases. The cellular features of distinction between the juvenile melanoma and the ordinary benign nevus of children were noted to be: 1) a pleomorphic structure; 2) bizarre mononuclear or multinuclear giant cells unlike those formed by fused nuclei in the benign nevus; 3) the junctional cells are pleomorphic, larger, and form looser projections in the dermis; 4) occasional mitotic figures. The benign nevus of children tends to be far more cellular than the benign nevus of adults. This pronounced cellularity may lead to the erroneous diagnosis of malignant melanoma just as the cellularity of hemangiomas of infancy has led to the diagnosis of angiosarcoma by those not familiar with the natural evolution of these lesions.

A comparison was made between the behavior of juvenile and adult melanomas, using another series of 17 melanomas occurring in patients ranging in age from 14 to 19 years. Five were in males and 12 in females. Three of the lesions occurred on the face or neck, 5 on the trunk, 2 on the upper extremity, and 7 on the lower extremity (none on the sole). All the lesions had been growing for one to two years before local excision; some had been present from birth. All of the female patients had undergone menarche from three months to four years before removal of the tumor; several gave the history that the pigmented cutaneous lesion had increased 2 to 3 times in size within three to four months after onset of menstruation. Of these 17 young adults, 12 are dead (71%), death having occurred within six to eighteen months after the initial diagnosis. One other with a metastasis has survived for four years. Since the average five year survival for adults of all ages, as determined recently in a series of 595 cases, is only 9.7%, these figures suggest that melanomas occurring in the adolescent period carry a more favorable prognosis than those appearing later. The lesions in several of the fatal cases among the young adults were extremely superficial and some had a qualitative histologic appearance far less malignant than many of the nonfatal juvenile melanomas. It is clear from these experiences and other reports that the capacity of melanomas to metastasize rises precipi-

tously after puberty. A hormonal stimulus of the age of puberty seems a logical conclusion. In this connection, 2 cases of malignant melanoma have been reported in the newborn in which ante-natal metastases have occurred; a variety of hormonal influences exist during this period which do not ordinarily obtain thereafter. 11 references. 4 figures.

Symposium on Wilms' Tumors. *William F. Burdick, W. Dabney Jarman, D. Joseph Judge, Isadore Lattman, E. Clarence Rice and Warren Sager, Children's Hospital, Washington, D. C. M. Ann. District of Columbia, Oct. 1948.*

Several different tumors arise in the kidney area, neuroblastoma, unattached retroperitoneal embryonal tumors and Wilms' tumor or embryoma of the kidney. All are malignant and are usually well encapsulated. They remain small for an unpredictable period and then enlarge suddenly and rapidly, usually because of massive hemorrhage into the rapidly growing tumor. Symptoms ordinarily are minimal. The first observation is usually a palpable abdominal mass, solid, non-tender and non-mobile, with a smooth and rounded border. Since early diagnosis and treatment are imperative, all physicians should palpate every child's abdomen thoroughly and deeply during routine physical examinations.

Nephrectomy should be done as soon as possible if technically feasible. When the tumor is too large, pre-operative irradiation should be used and operation done just as soon as the tumor has shrunk down, rather than waiting the conventional four to six weeks. Radiation should then be given, in as large doses as can be tolerated, over the entire lymph drainage area where metastases are likely to occur. This means the mediastinum and the nodes on both sides of the aorta. Metastatic lesions may develop during the two to three weeks needed for pre-operative radiation, which is why radiation in advance of operation is ordinarily not advised. An absolute diagnosis of Wilms' tumor cannot be made from the x-ray observations alone. A plain film of the urinary tract may reveal the intestines to be displaced toward the opposite side by a smooth round mass of increased density; the psoas shadow on the affected side may not be visualized at all or not as clearly visualized as on the normal side; occasionally some calcific shadows may be present on the affected side. When the tumor is small and young the plain film is negative. Urograms also may be negative if the tumor is small and does not impinge on the pelvis of the kidney. Occasionally with a Wilms' tumor the pelvis of the kidney may be so elongated and stretched as to suggest a polycystic kidney. Polycystic kidneys are usually bilateral. A complete study must include x-ray studies of the chest, long bones and skull because the difference of location of metastatic foci is of help in making a differential diagnosis. The neuroblastoma usually metastasizes to the lungs, pleura and liver. Both neuroblastomas and embryonic tumors of the kidney are fairly well fixed and usually occur on one side of the abdomen. The lack of nodularity tends to distinguish the embryonic tumors from the neuro-

blastoma. The neuroblastoma may have its origin quite apart from the kidney and may not involve it in any way; it also tends to much more extensive metastases and at greater distances from the original site. Both invade the lung and the liver, but Wilms' tumor rarely extends beyond these organs and the structures in the abdomen. Microscopically Wilms' tumor is made up largely of epithelial masses which may contain tubular-like structures. Connective tissue is also usually prominent, and muscle fibers and occasionally cartilage and bone are sometimes seen. Blood vessels not infrequently contain tumor cells.

Review of the statistics at the Children's Hospital, Washington, D. C., since 1934 reveals a total of 24 cases. Thirteen were boys, 11 girls, 14 were white, 10 colored. The tumor was on the left side in 14 and on the right in 10. No bilateral tumors occurred. Seventeen cases or 70.8% were in the age group from 1 to 5 years. The present policy in treatment is to remove the tumor surgically as soon as the diagnosis is made, and then expose the tumor area to post-operative radiation. Abdominal tumors must be treated as a strict emergency in children with palpation of the abdomen restricted to an absolute minimum. 10 references. 2 tables.

(This statement of the problem represents current thinking with respect to these tumors. One may well re-emphasize that physicians and teachers as well as parents must be educated to the existence of Wilms' tumors and tumors of children in general. Early diagnosis and prompt treatment will often lead to complete cure. For good abdominal palpation the child should be lying down and relaxed. Feeling of the abdomen while a child stands erect will often miss small-sized masses.—ED.)

THE PEDIATRIC BOOKSHELF

The Compleat Pediatrician. Sixth Edition. Practical Diagnostic, Therapeutic and Preventive Pediatrics. W. C. Davison, Professor of Pediatrics, Duke University, School of Medicine, Durham, N. C. Duke University Press, 1949. \$4.75.

Davison's "Compleat Pediatrician" is a familiar source of reference for all who deal with children. This new sixth edition is considerably expended and brought up to date—"6,500 lines have been changed." In addition to containing a vast store of factual information, the book is so organized that symptoms and signs can be individually looked up by the physician desirous of tracking down all probable causes of such disturbances.

Dental Caries. Mechanism and Present Control Technics as Evaluated at the University of Michigan Workshop. Kenneth A. Easlick, A.M., D.D.S., 1949. St. Louis, Mo., Mosby. \$5.00.

A conference on dental caries, sponsored jointly by the School of Public Health and the School of Dentistry at the University of Michigan, was held during the second week of September, 1947. The object was to appraise the present scientific status of information regarding the technics available to control dental caries. Nineteen persons, principally dental caries research workers, participated in the lectures and 114 people in all took part in the discussions and evaluations. The proceedings are herewith published, and will interest all concerned with caries problems.

Atlas of Dermal Pathology. 4th Edition. Edited by H. Montgomery. Washington, D. C. American Registry of Pathology Press, 1948.

The Atlas of Dermal Pathology is a carefully edited syllabus designed to accompany 100 representative slides of diseases of the skin. The material was collected and prepared by the Registry Committee on Dermal Pathology of the American Academy of Dermatology and the Army Institute of Pathology. Although it is not intended as a textbook, the inclusion of photomicrographs of most of the slides, with a detailed description of the findings, greatly increases its value as a reference source even without the accompanying specimens. The authors and collaborators are the most experienced dermatopathologists in the country and their descriptions of the skin diseases covered by the volume are of the highest accuracy and represent the concensus of American dermatology. Probably because of the necessity of

satisfying diverse opinions among the committee, the problem of the site of melanin formation is not handled definitively. The glossary has an inaccuracy in stating that Guarnieri inclusion bodies are found in varicella, but is otherwise excellent. This volume, now in its fourth edition, should be in the possession of everyone who has occasion to examine histopathologic sections of the skin.

Step by Step in Sex Education. *Edith Hale Swift*. New York, The MacMillan Company. 207 pp. \$2.50.

Through a series of scenes or "steps" beginning when the son is 2 years old and a daughter 3 months old, and ending when they go to college, a father and mother give their children not only scientifically sound information on sex, but also a healthy approach to family life in its broadest sense. This book renders a unique service to parents in that, though surely none of the actual scenes of the mythical family could be repeated, specific incidents are discussed which do occur in every family. A vocabulary is provided which many parents sorely lack, and a relation of sexual information to chronologic age is suggested, often a baffling problem for parents. The scope is greater than that of most books on this subject. It does not stop with the complete information on the physiology of sex but carries on through adolescence, and discusses the problems of that age in all its ramifications, such as "nice girls", petting, venereal diseases, continence, illegitimacy, prostitution, homosexuality, and birth control. A valuable book for parents, doctors, and all who counsel with youth.

New Books and Pamphlets

New Books

1. Children's Hospital: A History of Achievement and Progress from 1910 to 1947. *J. W. Amesse*. Denver, Children's Hospital Association, 1947. 95 pp.
2. The Parathyroid Glands and Metabolic Bone Disease: Selected Studies. *Fuller Albright and Edward C. Reifstein, Jr.* Baltimore, Williams and Wilkins, 1948. 393 pp. 157 illus. \$8.00.
3. The Master Hand: A Study of the Origin and Meaning of Right and Left Sidedness and its Relation to Personality and Language. *Abram Blau*. New York, Research Monograph No. 5, American Orthopsychiatric Association. 206 pp. 13 illus. \$4.50.
4. The Natural Development of the Child. *Agatha H. Bowley*. Ed. 3. Edinburgh, E. & S. Livingstone. 8s. 6d.
5. Stop Annoying Your Children. *W. W. Bauer*. Indianapolis, Bobbs-Merrill Co., 1947. 272 pp., illus. \$2.75.
6. Blood's Magic for All. Public Affairs Pamphlet No. 145. *A. L. Blakeslee*. New York. Public Affairs Committee. 32 pp. Illus. 20 cents.
7. Child Development: Physical and Psychological Growth Through the School Years. *M. E. Brackenridge and E. L. Vincent*. Ed. 2. Philadelphia, Saunders, 1949. 622 pp.

8. Polio and Its Problems. *Roland H. Berg*. Foreward by Basil O'Connor. Philadelphia, Lippincott, 1948. 174 pp., 24 illus. \$3.00.
9. Modern Methods of Infant Management. *W. R. F. Collis et al.* London, William Heinemann Medical Books. 285 pp. 17s. 6d.
10. The Hygiene of the Breasts. *Clifford F. Dowkontt*. New York, Emerson Books, 1948. 252 pp. Illus. \$2.50.
11. Nos Enfants Et Nous. Ed. 2. *Etienne De Greeff*. Tournai (Belgium), Casterman. 252 pp. 66 fr.
12. Technique of Treatment for the Cerebral Palsy Child. *Paula Egel*. St. Louis, Mosby. 203 pp. Illus. \$3.50.
13. Adolescence: Its Social Psychology. *C. M. Fleming*. London, Routledge & Kegan Paul. 270 pp. 16s.
14. Child Care and Guidance. *Helen C. Goodspeed et al.* Rev. ed. Philadelphia, Lippincott. 276 pp. Illus. \$2.40.
15. Psychosocial Development of Children. *Irene M. Josselyn*. New York, Family Service Association of America, 1948. 134 pp. \$1.75.
16. Précis de Médecine Infantile. *Clément Launay*. Paris, 1948. 1018 pp. Illus.
17. La Streptomycine. *R. Debré, H. E. Brissaud et al.* Paris, 1948. 204. Illus. 600 fr.
18. Pediatric Anesthesia. *M. D. Leigh and M. K. Belton*. New York, MacMillan, 1948. 240 pp. Illus. \$5.50.
19. Die Primäre Tuberkulose bei Erwachsenen und Kindern und Ihre Entwicklung. *Stephen J. Leitner and R. M. Steinmann*. Bern, Switzerland, Hans Huber. 156 pp. Illus. 15 Sw. fr.
20. The Rh Blood Groups and Their Clinical Effects. *Issued by Medical Research Council of Great Britain*. London, H. M. Stationery Office, 1948.
21. Advancing the Education of the Hospitalized Child. A Conference in Atlantic City, N. J., Feb. 26-27, 1948. *Sponsored by the National Foundation for Infantile Paralysis*. Publication 72. New York. 96 pp.
22. Breast Feeding. *F. Charlotte Naish*. London, Oxford University Press, 1948. 151 pp. 10s. 6d.
23. Overcoming Stammering. *Charles Pellman*. New York, The Beechurst Press. 160 pp. \$3.00.
24. Child Health Services in Oregon. Report of the American Academy of Pediatrics Study of Child Health Services in Oregon. *Made with cooperation of the United States Children's Bureau and the United States Public Health Services*. Salem, Oregon State Board of Health, 1948. 80 pp. Illus.
25. Trastornos Cardiovasculares en los Estados Carenciales Infantiles y Su Tratamiento. *Marcos Roitman F. Tesis*. Lima, Peru. Editora médica peruana, Azángaro, 1946. 300 pp. Illus.
26. Technik der Kinderärztlichen Differential-Diagnostik. *A. Sole*. Basel, Switzerland, Benno Schwabe & Co. 384 pp. 20 Sw. fr.
27. Your Baby: The Complete Baby Book for Mothers and Fathers. *Gladys Denny Shultz and Lee Forrest Hill*. New York, Doubleday. 278 pp. \$3.50.

28. Comics, Radio, Movies — and Children. *Josette Frank*. Public Affairs Pamphlet No. 148. New York, Public Affairs Comm., 1949. 32 pp. Illus. 20 cents.
29. Die Interstitielle Nephritis. *H. U. Zollinger*. Basel, Switzerland, S. Karger. 264 pp. Illus. 28 fr.
30. Synopsis of Pediatrics. *John Zahorsky and T. S. Zahorsky*. Ed. 5. St. Louis, Mosby, 463 pp. Illus. \$5.50.
31. Intelligence and Personality Factors Associated With Poliomyelitis Among School Age Children. *E. Lakin Phillips, Isabel R. Berman and Harold B. Hanson*. Monographs of the Society for Research in Child Development, Vol. 12, No. 1. Washington, Society for Research in Child Development, 1948. 66 pp.
32. Evaluation of the Mothers' Advisory Service. *Marcia Mann Cooper*. Monographs of the Society for Research in Child Development, Vol. 12, No. 1. Washington, Society for Research in Child Development, 1948. 42 pp. with appendix.
33. Neonatal Mortality and Morbidity. Report by a Joint Committee of the Royal College of Obstetricians and Gynaecologists and the British Paediatric Association. Ministry of Health Reports on Public Health and Medical Subjects No. 94. London, His Majesty's Stationery Office, 1949. 92 pp. 1s. 6d.
34. Nutrition in Relation to Child Development and Behavior. Proceedings of the Spring Conference on Nutrition in Relation to Child Development and Behavior of the Child Research Clinic of the Woods Schools, a Private School for exceptional Children, Langhorne, Pa., 1948. 36 pp.
35. Your Child's Mind and Body: A Practical Guide for Parents. *Helen Flanders Dunbar*. New York, Random House. 342 pp. \$2.95.
36. Diseases of Children. *Sir Archibald Garrod et al.* 4th ed. London, Edward Arnold & Co., 1,033 pp. 40s.
37. First Steps in Childhood. *G. M. Kerr*. London, Clerke and Cocheran. 120 pp.
38. Some Aspects of Hostility in Young Children. *Anneliese Friedsam Korner*. Grune & Stratton, New York City. 194 pp. \$3.50.
39. Heritage Craft Schools and Hospitals, Chailey, 1903-1948. *G. T. Kimmins*. Chailey, England, 1948. 123 pp.
40. How to Become a Doctor. *George R. Moon, A.B., M.A.*, University of Illinois. The Blakiston Co., Philadelphia. \$2.00.
41. The Normal and Pathological Physiology of Pregnancy. *National Research Council Committee on Human Reproduction*. Baltimore, Williams and Wilkins, 1948. 176 pp.
42. Naturforschung und Medizin im Deutschland 1939-1946, v. 76. *Kleinschmidt, H., ed. Kinderheilkunde*. Dieterich, Wiesbaden, 1948. 243 pp.
43. The Normal Sex Interests of Children From Infancy to Childhood. *Frances Bruce Strain*. Appleton-Century-Crofts, New York, 1948. 210 pp. \$2.75.

44. Polycories (Storage Diseases). *Robert Debré*. Paris, France, G. Doin & Cie, 1947. 126 pp. 215 fr.
45. Phthisiologie Infantile. *Pierre Lowys*. Preface by R. Debré. Paris, France, Editions Medicales Flammarion, 1947. 716 pp. Illus. 2,120 fr..
46. Melk: in het bijzonder als zuigelingenvoedsel. *J. H. De Haas, and I. O. Muelemans*. Ed. 2 Batavia, Tweede Druk, 1947. 112 pp.
47. Le syndrome de diabete renal avec rachitisme osteomalacique incurable et troubles du developement chez l'enfant. *Robert Debré*. Paris, France, G. Doin & Cie, 1947. 64 pp. Illus. 1245 fr.
48. Elmtown's Youth: The Impact of Social Classes on Adolescents. *August Hollingshead*. New York, Wiley, 1949. 480 pp. Illus. \$5.00
49. Adopting a Child. *Frances Lockridge, with the Assistance of Sophie van S. Theis*. Ed. 2. New York, Greenberg, 1948. 229 pp. \$3.00.
50. EMIC (Emergency Maternity and Infant Care); A Study of Administrative Experience. *N. Sinai and O. W. Anderson*. Ann Arbor, University of Michigan School of Public Health, 1948. (University of Michigan. Bureau of Public Health Economics. Research Series, No. 3). 181 pp.
51. Die Tuberkulose Des Kindes: Ein Lehrbuch Aus Der Kinderheilstätte Wangen im Allgäu. *Heinrich Brügger, Reiner W. Müller und Maria Birkenfeld*. Stuttgart, Georg Thieme, 1948. 340 pp. Illus.
52. Über Die Nierentuberkulose im Kindesalter. *Reiner W. Müller*. Stuttgart, Georg Thieme, 1948. 49 pp. Illus.
53. Food Value Charts. Philadelphia, Philadelphia Child Health Society, 1948. \$1.00.
54. Tos Ferina (Whooping Cough). *Jeronimo Pou Diaz*, Seville. Publication of Revista Española de Pediatria No. 6. Zaragoza, Spain, 1949.
55. Enuresis or Bed-Wetting. *R. J. Batty*. Ed. 2. London, Staples Press. 103 pp.

Announcements

SIXTH INTERNATIONAL CONGRESS OF PAEDIATRICS ZURICH 1950.

The sixth International Congress of Paediatrics in Zurich will be held from July 24 to July 28, 1950. The scientific exhibition, in which the World Health Organization will participate, will take place from July 21 to July 31. The languages at the Conference will be English, French, German, Italian, Russian and Spanish, but mutual understanding would be greatly facilitated by the use, as far as possible, of English or French. In the volume containing the lectures, contributions in English, French, German and Italian will be printed in the original languages. For technical and financial reasons it is not possible to publish the lectures given in Russian and Spanish. The authors should enclose a translation in either English or French. The exhibition guide and the conference program will be printed in English and French.

The Organizing Committee has appointed the American Express Company, Inc. official travel agency for this Conference. The American Express Co. in collaboration with the authorities concerned will arrange for accommodations in Zurich and for the travel arrangements of the delegates from the various countries. Details will be published in a prospectus issued by the American Express Co. with the help of the Organizing Committee.

MIDCENTURY WHITE HOUSE CONFERENCE ON CHILDREN AND YOUTH

President Truman has called a White House conference on Children and Youth. This will be held in Washington in the week commencing Dec. 3, 1950, and will be known as the Midcentury White House Conference on Children and Youth.

Of the 52 members of the National Committee appointed August 29, 1949, 3 are pediatricians. These are: Dr. Charles A. Janeway, Harvard University; Dr. Edward B. Shaw, University of California; and Dr. Benjamin Spock, Mayo Clinic.

The recommended objectives of the Conference shall be to consider how to develop in children the mental, emotional, and spiritual qualities essential to individual happiness and to responsible citizenship. To do this the Conference shall:

- (a) bring together in usable form pertinent knowledge related to the development of children and indicate areas in which further knowledge is needed;
- (b) examine the environment in which children are growing up, with a view to determining its influence upon them;
- (c) study the ways in which the home, the school, the church, welfare agencies and other social institutions, individually and cooperatively, are serving the needs of children;
- (d) formulate, through cooperative efforts of laymen and specialists, proposals for the improvement of parental, environmental and institutional influences on children;
- (e) suggest means whereby these proposals may be communicated to the people and put into action.



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of
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1949



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A REPORT on new clinical research in infant nutrition

BY SWIFT & COMPANY—PIONEER OF MEATS FOR BABIES

To further scientific knowledge and determine more precisely the role of meat in the infant's diet, the following studies have been or are now being conducted as part of a continuing program, through grants-in-aid made to various universities and research institutions by Swift & Company.

THE EFFECT OF MEAT IN THE DIET OF INFANTS AND YOUNG CHILDREN

Results of this study indicate that meat promotes hemoglobin and erythrocyte formation. These findings were revealed in a preliminary report published in the J.A.M.A.* The present studies are a continuation of the work reported in this article.

*J.A.M.A. 134 1215 (1947)

STUDIES ON THE UTILIZATION OF THE NUTRIENTS IN STRAINED MEATS BY PREMATURE INFANTS

These studies were designed to compare the utilization by premature infants of the nutrients in milk, meat-supplemented milk, and milk-substitute diets. The balance method is being used to determine the utilization of calcium, phosphorus, iron, fat and nitrogen.



THE NUTRITIONAL VALUE OF CALCIUM-ENRICHED MEAT AS COMPARED WITH THAT OF MILK

From this research has evolved a milk substitute for infants and children who are allergic to milk or who for any other reason are unable to include milk in their diets. The milk substitute consists of Swift's Strained Meat supplemented with calcium and phosphorus salts, carbohydrate, fat and certain vitamins. Published results** show that the calcium, phosphorus and protein are utilized as well as these same nutrients in milk.

**Proc. Soc. Exptl. Biol. Med., 65, 120 (1947)

SLEEP CHARACTERISTICS OF THE HUMAN INFANT

An investigation of the sleeping habits of infants six to twenty-six weeks of age is being made in the study. The effect of diet on the sleeping habits of infants under study is one phase of the investigation. The protein content of the experimental diet is being increased by 25% by feeding the baby Swift's Strained Meat. Special apparatus attached to the cribs records the movement of the infants and indicates their periods of sleep and wakefulness.



THE EFFECT OF STRAINED MEAT IN THE DIETS OF PREMATURELY BORN BABIES

In this research the effect of meat on the hemoglobin concentration, erythrocyte count, weight gains, and serum protein values of prematurely born infant is being investigated. Other factors that develop in the course of the study will be analyzed as to their value to infant nutrition.



THE EFFECT OF MEAT IN THE DIET OF A LARGE GROUP OF INSTITUTIONALIZED CHILDREN

This study was established to investigate the effects of including Swift's Strained Meat in the infants' diet for periods of at least a year in length. Numerous observations have been made and the results are being tabulated to obtain information on the relationship of dietary meat to growth, blood composition, incidence and severity of infections, and general well-being of infants.



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TO A WIDE VARIETY OF FOODS

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●

FAILURES only where excessive soap is present in diaper and if soap is not thoroughly rinsed from diaper.

ANTICIPATED RESULTS—no noticeable ammonia present after 4 days with resultant disappearance of rash and ulceration.

MaroC Diaper Powder—consisting of 0.5% Benzalkonium Chloride in a talc-kaolin base, to be dusted onto inner surface of diaper next to skin, resultant solution of Benzalkonium Chloride in urine is sufficient to inhibit growth of ammonia forming bacteria. Non-toxic, non-irritating, may be used continuously. Guinea pigs have been fed Benzalkonium Chloride in drinking water for months without any demonstrable effect. Easy to prescribe—simply dust in diaper, sleepers and bedclothing; most effective with waterproof pants.

Simple - Effective - Inexpensive

Samples for office use will be furnished on request.

The **MAROC COMPANY**

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1. HIGH IN PROTEIN—19%—as a result, a single ounce of Cerevim provides 5½ grams of protein—plus:
 2. THIAMINE—0.6 mg. per ounce of Cerevim "The cumulative effects throughout a lifetime... (of thiamine)... may spell the difference between alert, successful living and a marginal effectiveness."¹—plus:
 3. NIACINAMIDE—6.0 mg. per ounce of Cerevim in accord with The National Research Council's recommended allowance²—since "Nicotinic acid is found in natural foods only in limited amounts."³—plus:
 4. RIBOFLAVIN—0.9 mg. per ounce of Cerevim for this factor is directly related to growth⁴ and is "essential to the defense powers of the organism"⁵—plus:
 5. CALCIUM—300 mg. per ounce of Cerevim thus supplying 8 times the calcium in a fluid ounce of milk—plus:
 6. IRON—7.5 mg. per ounce of Cerevim since "a child's increasing need for iron cannot safely be left to chance."⁶—plus:
 7. COPPER—0.3 mg. per ounce of Cerevim in the 1:25 ratio which Elvehjem, et al.⁷ and Cason⁸ found particularly effective in raising hemoglobin levels in infancy.
- With such natural foods of high biologic value as:
8. WHOLE WHEAT MEAL 9. OATMEAL 10. CORN MEAL 11. NON-FAT MILK SOLIDS 12. BARLEY
 13. WHEAT GERM 14. BREWERS' DRIED YEAST 15. MALT

Leading to such benefits as the literature⁹ reports:

16. "increase in urinary output of riboflavin" 17. "improvement in pediatricians' scores" 18. "improvement in skeletal maturity" 19. "improvement in skeletal mineralization" 20. "retardation of increase in dental caries" 21. "recession of corneal vascularization" 22. "improvement in the condition of the gums"
23. Better Bowel Function¹⁰
24. PALATABILITY—Cerevim makes all the above acceptable as well as available to infants and children.

in all—24 good reasons why CEREVIM is a first among first foods

a pre-cooked cereal for professional specification now
produced exclusively at the M & R Dietetic Laboratories

BIBLIOGRAPHY:

- (1) Harrell, R.F.: J. Nutrition 31:283 (Mar.) 1946.
- (2) National Research Council, Recommended Dietary Allowances, 1945.
- (3) McLester, J.S.: Nutrition and Diet in Health and Disease, ed. 4, Phila., W.B. Saunders Co., 1943, p. 78.
- (4) Sherman, H. C.: Chemistry of Food and Nutrition, ed. 7, N.Y., Macmillan Co., 1946.
- (5) Council on Pharmacy and Chemistry and Council on Foods of the A.M.A.: The Vitamins, Chicago, American Medical Association, 1939.

- (6) Dickson, M.A.: Yearbook of Agriculture, U.S. Gov't Printing Office, Supt. of Documents, Washington, D.C., 1939, p. 203.
- (7) Elvehjem, C.A.; Siemers, A., and Mendenhall, D.R.: Am. J. Dis. Child. 50:28 (July) 1935.
- (8) Cason, J.F.: J. Pediat. 4:614 (May) 1934.
- (9) Urbach, C.; Mack, P.B., and Stokes, J., Jr.: Pediatrics 1:70 (Jan.) 1948.
- (10) Joslin, C. L., and Helms, S. T.: Arch. Pediat. 54:547 (Sept.) 1937.

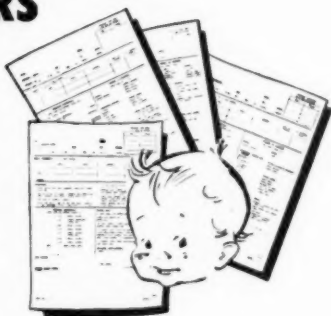
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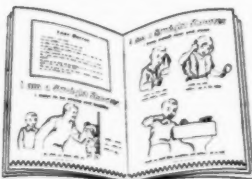
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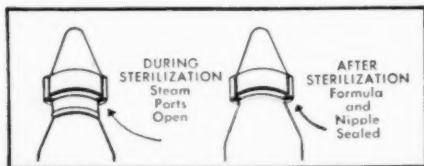
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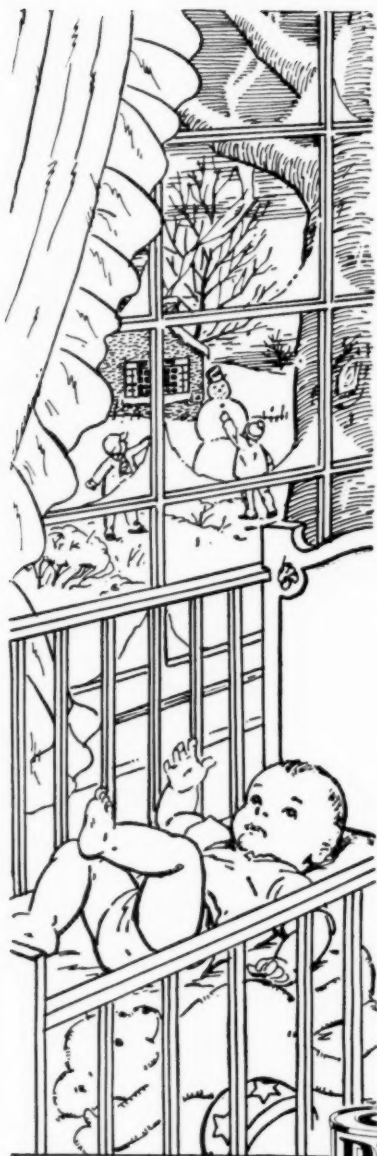
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